★1st Issue

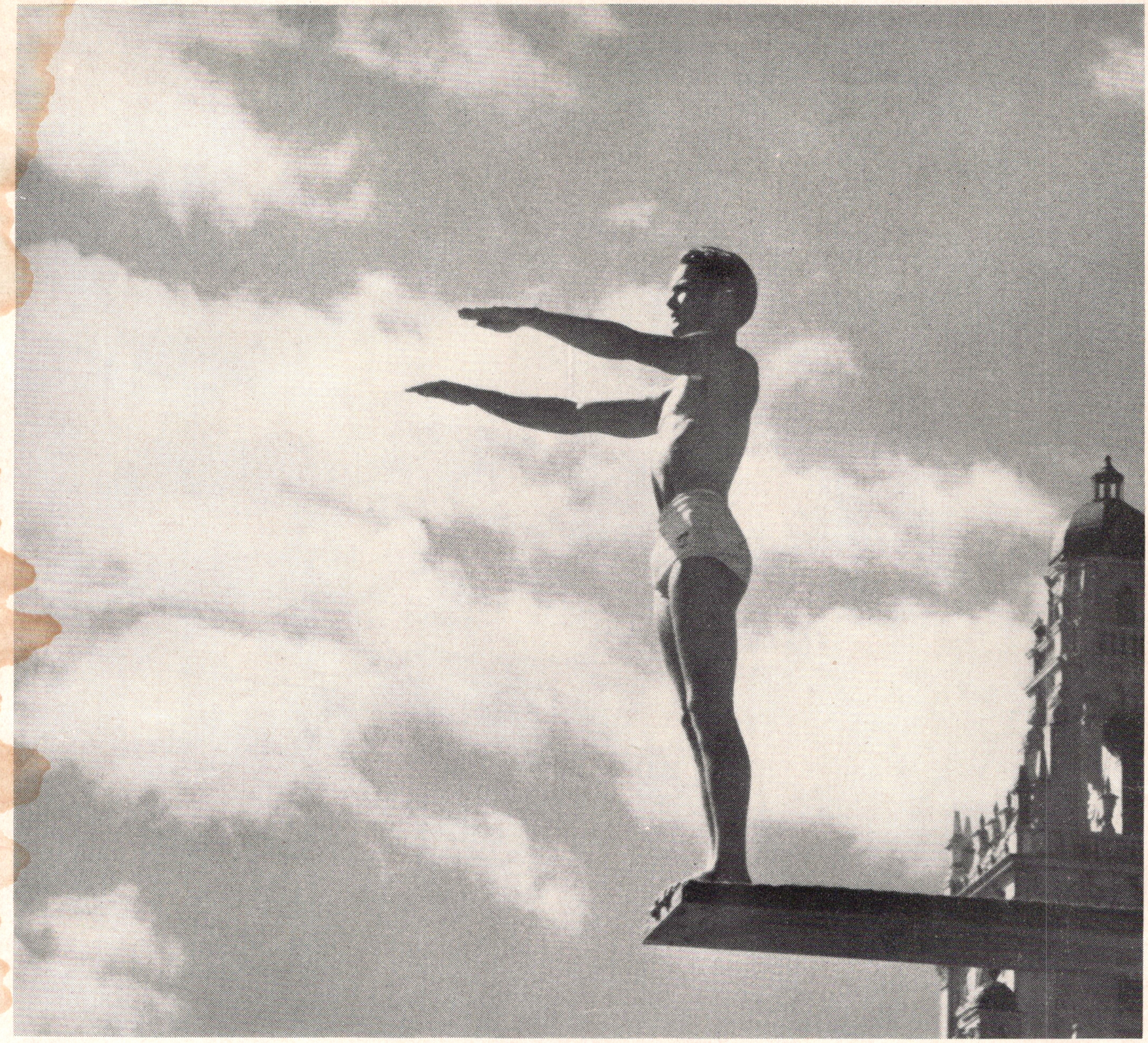
Popular Photography

- PHOTO KINKS
- CANDID SHOTS
- HOME MOVIES
- COMMON ERRORS
- TRICKS EXPOSED
- PHOTO MARKETS
- EXPOSURE CHARTS
- COLOR PHOTOGRAPHY

Answers All Questions About Photography

SEE PAGE 23

MAY 25c



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CANDID SHOTS

by the Editor

GREETINGS! After over a year of careful planning and many gallons of midnight oil, the staff of POPULAR PHOTOGRAPHY bids you welcome and happy exposures.

* * *

We hope you have half as much fun reading the issue as we did in preparing it. Not that it was all fun—there were lots and lots of headaches. But our problem was made much easier, through the wholehearted support of hundreds of leading photographers and art directors throughout the world.

By careful elimination we sifted the very best that was offered, literally from the four corners of the world. And so we shall do next issue, and each issue after that. Thus each month, POPULAR PHOTOGRAPHY will bring you the very latest and best information the photographic world has to offer.

* * *

HOW do you like our front cover? We chased all over the country to get one that suited us, and we hope, you too. Kodachromes, Findlays, Dufays came in from Florida, New England, California and even Hawaii. Nothing came up to our rigid requirements. So, as a last resort, after hunting all over the country, we began to search our own backyard.

There we found Stan Young, owner and designer of one of the few one-shot color cameras hereabouts. He accepted the assignment and successfully turned out what we regard as a bang-up example of direct color photography. Elsewhere in the issue we discuss Young's camera and have even included some candid shots that were taken of Young and his lovely model.

The bathroom in which the picture was made had gold-plated fixtures, raised bathtub, and cost over $10,000. Taking a bath must have been a real pleasure in this home. Come to think of it, the model seems to be having a pretty good time at that.

* * *

POPULAR PHOTOGRAPHY, is a magazine for professionals and amateurs alike. Both groups will read it; both will write it.

We especially invite readers and amateurs to send in letters and articles—typewritten or longhand—on their photographic experiences. A glance through this issue will tell you what we need—so join right in and send us your interesting ideas and snapshots. All pictures and material accepted will be paid for at professional rates.

THERE are several new magazines now on the market, like *Life* and *Look* which are classified as "picture magazines." These publications go in for the story in the picture. We're not so much interested in the story *in* the picture as we are in the story *behind* the picture—who took it, how, what camera, what stop, what film, what exposure.

For example, consider the story about the thief who was caught swiping milk through an automatic flash exposure. This picture appeared in *Life* because of the story it told. POPULAR PHOTOGRAPHY was interested in what was behind that picture and after considerable investigation obtained the complete layout, wiring plan and camera details. Now all of our readers can duplicate this experiment, thus catching any man who tries to steal your milk, best girl, or first issue of POPULAR PHOTOGRAPHY.

* * *

MANY new inventions are on the verge of public announcement that will be of tremendous interest to the world of photography. One manufacturer will introduce a brand new miniature camera, domestically made, that will be as complete as the foreign ones and cheaper. We hope the rumor is well-founded, as we're all for the growth of home industries and miniature cameras. In fact later on we may have some bitter words to say about some of our home manufacturers who have been resting too long on their early laurels.

Agfa, we understand, will be ready in about a year to introduce a new color film that will give marvelous results. Don Wallace, just returned from abroad, tells us that this Agfa color film is already in use over there.

And of even greater interest is the new Agfa method of hypersensitizing standard film by a dry process that tremendously increases its sensitivity. This story will be found in this issue.

* * *

DID you enjoy the story about Naomi Anderson and her experience as a model? She's very charming, you know, even prettier than her pictures. Your editor asked Naomi to come down to the office two or three times to check over final proofs. Maybe once would have been enough, but after all, she really is worth reading proof with.

* * *

BEAUTIFUL pictorial studies will always have a place in POPULAR PHOTOGRAPHY especially where they present an interesting technical problem. One of our favorites is the Pearl Study done by Harry Shigeta and featured in this issue. Shigeta is one of America's outstanding pictorialists, born in Japan, trained as an artist, at one time a professional magician, and a resident of America since he was 14. His Pearl Montage has been shown in many salons and published in rotogravure. Only his intimates knew how the picture was made and we prevailed on him to give us prints from the three component negatives from which the lovely montage was made. It was originally made as an advertising picture for the Mikimoto Co., originators of the cultured pearl.

* * *

WE'VE known Jack Hazlehurst for so many years that he was the first photographer we thought of in making the shots on "How Would You Take Her?" Jack's so full of tricks and so wise on makeup that we knew he could take the same model and make her look like ten other people without any trouble. Suspecting his free use of makeup (one look at the à la Mortensen shot should convince you), we asked him—for heaven's sake—to give us one shot of the model as she really looked. The portrait came through, but by that time we were so suspicious that we decided not to trust Hazlehurst. We sent out a staff artist to give us a true sketch of the model. It's a case of the camera being able to lie so much, we had to trust an artist's pen to get a genuine reproduction.

* * *

HAZLEHURST'S lovely model for his double-page feature, "How Would You Take Her?" is Linda Yale. Linda is only 21 and up until recently lived in Des Moines. Several years ago she wrote up an interview with President Hoover and won a four-year scholarship at Ames in a National Journalism Contest. While at school she earned a little extra money by modeling and found her work so interesting and successful that she moved to Chicago after only one year.

Her career in Chicago as a professional model moved swiftly. After being selected by POPULAR PHOTOGRAPHY as a model for the Hazlehurst feature she was spotted by some M-G-M scouts in town, who had seen the preview releases on the pictures which appear in this issue. An audition soon followed which resulted in a seven-year contract, salary ranging from $75.00 to $750.00 per week. POPULAR PHOTOGRAPHY is indeed proud to be the first to introduce this new

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MAY
1937
VOLUME 1
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Exciting Experiences of

By JACK PRICE

Former Chief Cameraman New York World, Author, Columnist

As the years roll along, the newspaper photographer becomes more important in the make-up of a paper. The equipment he uses changes with the scientific developments, but his method of operation remains the same. Considering the vast differences between the old fashioned cameras with slow lenses and films or plates, which had about one-fifth the speed now employed, we find that the difference in the work has been altered very little.

The main objective of a newspaper photographer is the recording of news with his camera. The type of camera used is a secondary item in covering an assignment. The editor rarely asks about the technique employed by the cameraman; what he is interested in is "did you get the picture?" Excuses only lead to an early dismissal.

While the camera plays an important role in the securing of a good picture, the seasoned cameraman puts more faith in his "eye for news" than the apparatus he uses. Excellent workmanship can be developed much in the same manner which is displayed by any good craftsman. Knowledge of photography though important, is only part of the curriculum of a good newspaper cameraman.

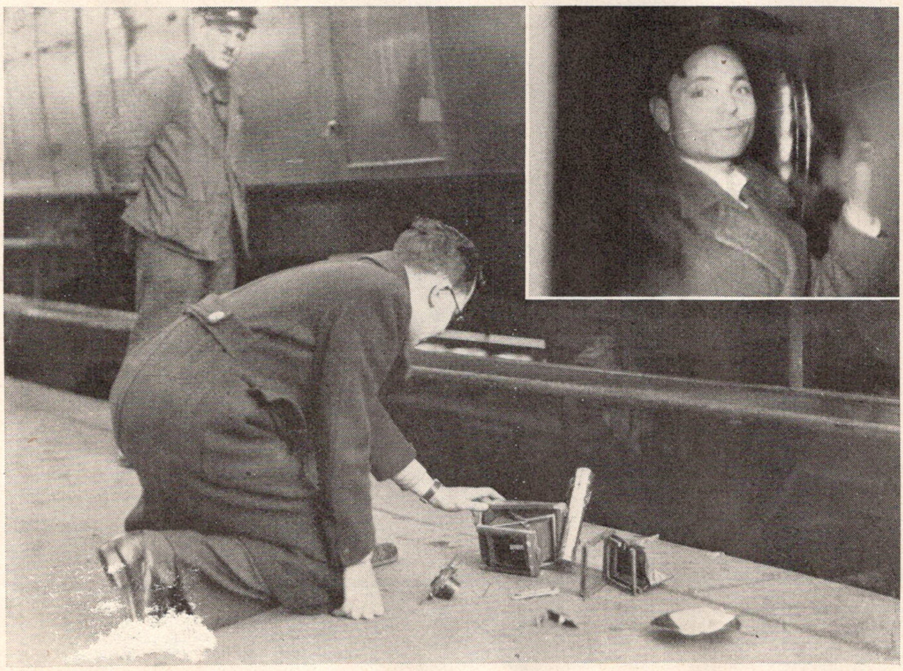
It takes much training and practical experience to develop a first class newspaper photographer. Hardships, disappointments and a rough road of travel are the factors constituting the real schooling which a news photographer learns before he is classified with the great.

Oddly enough, there are cases where cameramen have become famous through lucky breaks. Every now and then even an amateur clicks his way to fame and fortune through accidental situations. But for steady dependability which the editor prizes more than spectacular display, the newspaper photographer who has studied general news coverage, will be more desirable and the one to remain on the payroll indefinitely. It is the eye for news and the ability to make the most of a situation which distinguishes the good man from the inferior.

The profession has been built upon a solid foundation. The pioneers have set a standard which has never been lowered. The integrity and honesty shown by the early members leads the way for the future cameramen who will find these qualities an asset to their success.

All the thrills and achievements of a newspaper cameraman's life are related in this intimate article by a leader of his profession.

In the early days of newspaper photography, many a cameraman has been tempted with bribes but there was never an instance for the necessity of accusation. The public has been taught to accept the illustrations they see in the papers as authentic, and rightly so. It is true that an artist can distort a picture and the cameraman can, by devious methods, make his picture untruthful. Yet, these practices are never tolerated by any reputable publisher.



When Pierre Marini, Paris gangster, boarded his train under heavy police guard, friends objected to a press photographer. The camera was smashed as shown, but the negative of Marini (inset) was saved.

When we speak of personal danger, it should be understood that no editor or publisher will actually order his cameraman to risk his life in covering an assignment. Conditions arise on a story which cannot be forseen. It is little less than cowardice for a photographer to return with an alibi without having taken some chances.

There have been cases where men have been wounded and, in at least one instance, loss of life has occurred. Back in 1915, a blimp was flying over Chicago carrying a newspaper photographer along with some passengers and crew. The blimp crashed into a building in the heart of the city and the cameraman was killed in the accident.

Of course, while this unfortunate accident occurred, it did not deter cameramen from covering an assignment which called for work in the air. In fact, the thought of danger lends an adventurous atmosphere to such assignments and photographers are more than ever eager to go up in planes and balloons.

Newspaper photographers are really explorers and adventurers at heart. When an assignment has the earmarks of danger, the lens-lads will rush to ask for the job. Whether it is a war in Ethiopia or a revolution in South America, the press photographer is found on the firing lines. It has been so since the days of the Civil War, when photography was in its infancy.

When we speak of the eye for news, we can refer to the famous picture of the shooting of Mayor Gaynor in New York and also the shooting of Mayor Cermak of Chicago. In both these instances we find that the eye trained by years of experience, functioned with precision, although the action took place in a split second.

In the summer of 1910, several events were marked on the assignment sheet by the city editor for coverage on a certain day. New York City had picked a certain day in which to inspect the new fire-fighting apparatus, which was to replace the old, horse-drawn engines. William Warnecke, staff photographer of the Evening World, was assigned by City Editor Chapin to cover the parade of the new auto fire engines and other apparatus which the city had just purchased.

It had been Chapin's idea of covering this assignment by means of a

A Newspaper Photographer

contrast which cost Warnecke many headaches. Chapin wanted a series of photographs showing a horse in a laughing attitude, and this was to be published opposite a photo of a motor-driven fire engine. While this assignment sounds easy, it was a difficult task to get a picture of a horse laughing.

Bear in mind that the assignment was given at 7 A. M. and Editor Chapin expected the pictures on his desk before 8 P. M. Warnecke tried several fire stations and the firemen assisted in trying to pose a horse in a laughing attitude. This was a failure. Warnecke did make some pictures of a horse with its mouth open, but none of these pictures seemed genuine.

Finally, down in the markets, Warnecke came upon a teamster who promised to aid him. Sure enough, with the teamster's aid, Warnecke secured a splendid picture of a horse actually laughing. Just what trick the teamster used in making this horse appear in a laughing pose was not disclosed, but the answer is that the assignment was covered. Following the usual procedure of phoning the city desk, Warnecke reported to City Editor Chapin.

It was still early and Chapin, having been informed that Mayor Gaynor's departure was not covered, ordered Warnecke to rush over to Hoboken and cover the mayor's sailing. There was very little time allowed for Warnecke to make the trip across the river. Nevertheless, he did get to the boat in time.

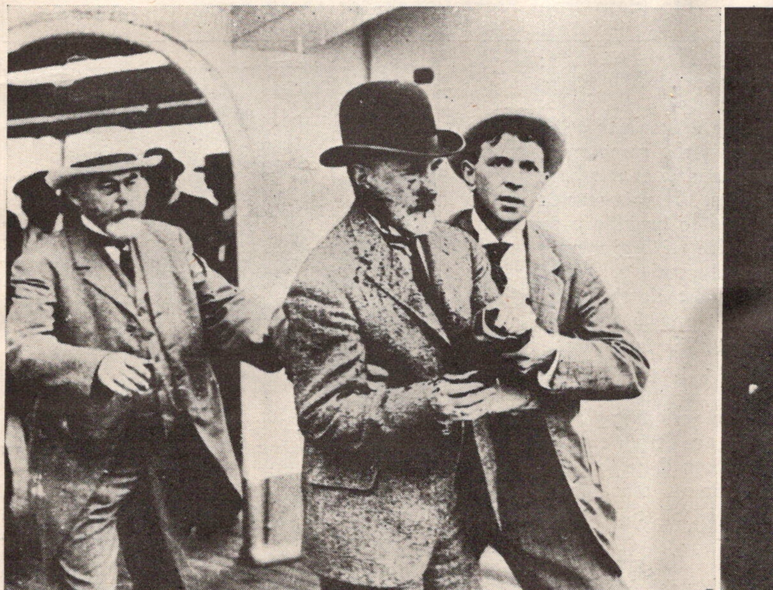
The odd part of this assignment, which eventually brought about the famous picture, was the fact that Warnecke, who had been in the habit of covering ship news, was generally late. His tardiness was not due to laziness nor his inability to make the ship on time, but due rather to the conditions which prevailed.

Warnecke being the early man, usually received another assignment prior to the ship news. Hence, he was considered slow in the eyes of his colleagues. But, on this summer morning when he appeared at the pier, he was met by his brother photographers, who razzed him considerably.

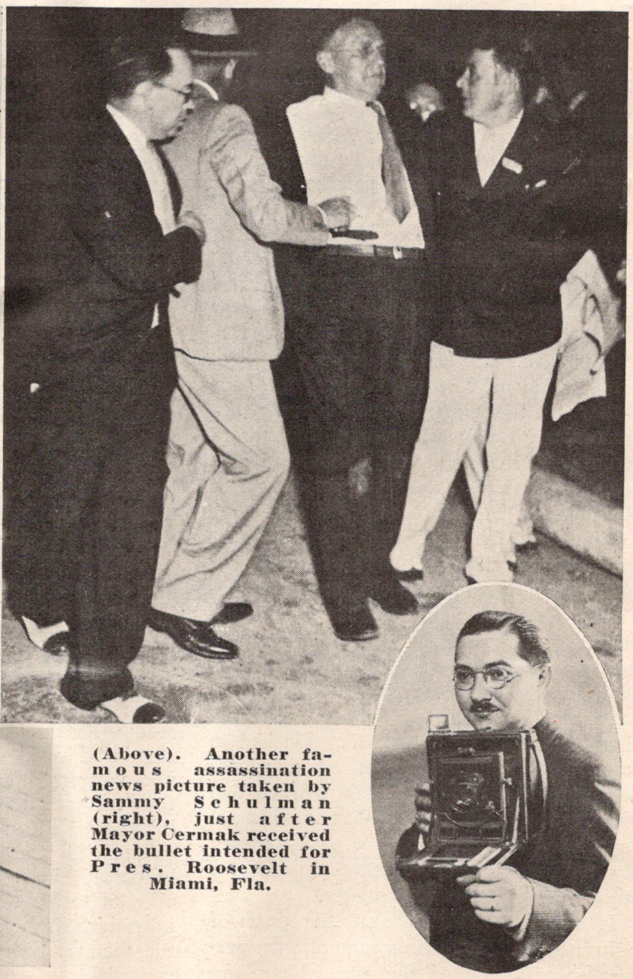
Being good-natured and realizing that Warnecke would have little time to get the picture of Gaynor, the other photographers tried to assist him by offering some of their shots. Warnecke, however, was quite peeved by the razzing he had received and decided to make his own. Dashing for the gangplank and at the same time opening his camera, he got aboard before the gong sounded for "all ashore."

Mayor Gaynor had just started towards his stateroom when Warnecke reached the deck. Running forward, he took Mayor Gaynor by the arm and pleaded for a chance to make a picture. Gaynor, who was always congenial to photographers, consented and walked back into the sunlight to permit Warnecke to obtain his picture. Warnecke had just sighted his camera when an assassin fired a shot at Gaynor.

Warnecke quickly sized up the situation. He did not lose his head, but waited a second or two until Gaynor started to sag. Then he made a shot which was more graphic and told a more descriptive



The most famous of all news photographs. Taken by Bill Warnecke a few seconds after Mayor Gaynor of New York was shot by an assassin. Note the blood flowing from the wound.



(Above). Another famous assassination news picture taken by Sammy Schulman (right), just after Mayor Cermak received the bullet intended for Pres. Roosevelt in Miami, Fla.

story than if the picture had been made at any other time.

Now we must realize that, considering the equipment which Warnecke was operating, a second meant a lot of time. Had he made his exposure when he heard the shot, it would not have been as dramatic as the one he secured.

With the old-fashioned camera, using plates, it would have been necessary to remove the plate holder, get another one out of his pocket and reset the shutter—all of which would have taken time enough to cost him the loss of his great picture. Being an experienced newspaper photographer, he stood by and covered the story to the end.

The end came when the police hustled the assassin into the police wagon. He covered all these phases and secured a series of splendid exclusive pictures. Stopping long enough to phone his paper, he then dashed to the office. Editor Chapin was holding an edition for him, and with speed compatible with that shown even today with our modern and scientific developments, Warnecke made the deadline.

Of course, this particular assignment had all the earmarks of the so-called "lucky break." It has been argued that if Warnecke had not been irate over the jibes of his fellow-cameramen, he would not have secured this exclusive break. It so happened that the other photographers were well on their way to their offices when the story actually broke, giving Warnecke the chance of a lifetime.

This picture has become so famous that it was selected as the prize winner by a board of laymen, picked to judge the recent contest held by the New York Press Photographer's Association. Twenty-five years after it was made, this picture still stands out as the news picture Number One.

WE have another situation, differing somewhat from the Gaynor story, and that is the photo of the shooting of Mayor Cermak of Chicago.

This, also, was an exclusive shot, not brought about by an accident, but due rather to the alertness of a newspaper cameraman, Samuel Schulman, of the International News Photos. Schulman was assigned to cover the visit of President Roosevelt in Florida.

Wherever the President went, Sammy was not far behind. On this particular occasion, when an assassin cut loose and shot Mayor Cermak, Schulman, by an almost herculean task, obtained a picture which will go down in the annals of news photography as one of the greatest.

Schulman used equipment differing from that used by Warnecke. He had to rely upon the mechanism of a speed-flash-synchronizer. In the days when this picture was made, this mechanism was not considered a perfected piece of apparatus. By that we mean the synchronizer was still in its experimental stages.

It required alertness on the part of Schulman to operate this camera with perfect coordination of the eye. There are many different motions in the operation

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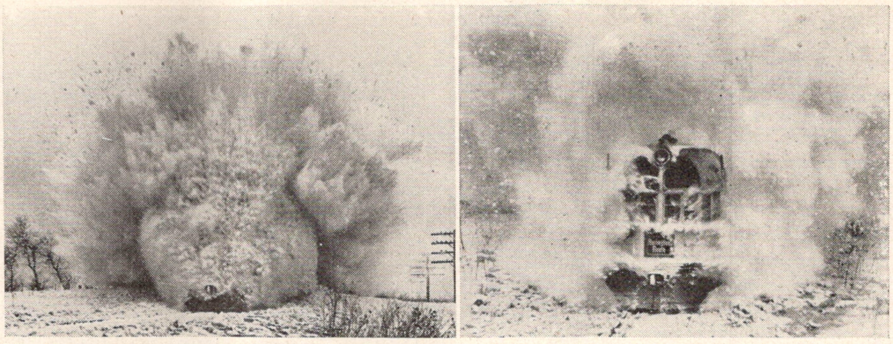
Catching Trains at 80 M. P. H.



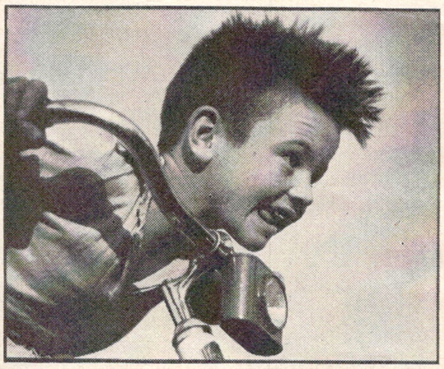
TAKING a picture of a train coming head-on at the camera at 80 miles an hour may seem very thrilling to some people, but to a professional photographer it is all part of his daily work.

Mike Kostre, a photographer with All-Event Photo Service of Chicago, was called upon to take such a picture for the Edward G. Budd Manufacturing Company of Philadelphia. He took his equipment to Lee, Ill., which is on the Minneapolis-Chicago run of the famous streamline Twin Zephyrs of the Burlington Railroad.

The weather was zero and the wind had blown the snow into high drifts. Light conditions were very poor. Two shots were made, both at a shutter speed of 1/1000. The picture at the left, showing the Zephyr plowing through a 6-foot snowbank was shot with a Graphic at f 8. The picture at the right, showing a head-on view, was likewise taken at 1/1000, but was shot from the top of a signal tower. In this picture a Graflex Camera was used and the stop set at f 5.6. In both cases panchromatic film was used.

The Paramount Studio Camera Club

No Help from Professionals for These Fans



A prize-winning picture titled "Young America," taken by member Lew Ami.

THE Camera Club, composed of workmen in Hollywood's Paramount Studios, is unique in the sense that it receives no assistance from the company's professional camermen and does not have access to studio facilities. It was started in the early part of 1936 to provide a means of fulfilling the desire of beginners to compete with advanced members. Members are faced with every obstacle that would confront such a club anywhere. While the studio encourages this enterprise, it does not sponsor it and provides no technical help.

Many of the prize winning pictures in the Paramount Salon are genuine works of art, but nothing has been done there that cannot be duplicated in any office or shop anywhere in the United States where men and women are employed.

Every member of the club is strictly an amateur, and Lewis Ami, who took most of the prizes for 1936, had never taken a picture in his life until he became a member. His prize for the year was a $100 camera. Mr. Ami is employed in the precision machine shop, and during his spare time studies drama. Since his phenomenal success in taking pictures, he is convinced that photography offers a better field for him than the screen and is tempted to abandon his pursuit of an acting career.

The club meets monthly in winter and bi-monthly in summer. Each contestant is allowed to hang five prints. No name or other identification appears on the front of the picture, but on the back is a sticker *giving* entrant's name, type of camera used, etc.

Prints are judged by prominent men connected with photography. Popular votes are taken also, each member voting by ballot before the judges' decision is given, so neither influences the other. Eight places are awarded. The first is given ten points, the second nine points, etc.

The Club is divided into two classes. Advanced, for members who do all their own work from shooting to finished print, and Beginners, who shoot the pictures only and have the finishing done by someone else. Separate awards are made for the latter group.

During 1937, each member of the Advanced Class will have a protegé, whom he will take on trips over Sundays and holidays and teach the tricks of the trade.

At the first meeting of each month, prints are judged and prizes awarded. The second meeting of each summer month is given to entertainment which is directed in a constructive manner.

How to Pose Your Subject

By JACK POWELL

A professional photographer of Pasadena, Cal., offers valuable tips to the amateur interested in home portraiture and who has struggled valiantly with the lighting problem.

BEFORE proceeding headlong into my subject in this article, perhaps a word or two will be in order on my equipment.

I have two cameras which I use a great deal in my work, one is the Contax, a miniature, and the other is an old 3¼x4¼ revolving back Graflex. The first has an f2.8 Tessar lens while the latter is equipped with a Kodak Anastigmat f4.5.

I also use an Agfa Ansco Studio camera equipped with a Graf variable 18-inch lens. This camera I save for the gentle dowagers of Pasadena who do not believe that a large picture may emerge from such a small thing as the Contax. If they only knew! At this writing I will lay aside the Contax and describe my methods of procedure with the Graflex.

A Graflex is splendid for portraiture and general landscape work, but for many reasons it is not suitable for architectural work. Commercial and illustrative advertising require an entirely different technique and may be discussed in a future article.

Fig. 1 illustrates a set-up showing placement of the lighting equipment in relation to the camera, subject and background.

There are two standards, each equipped with an aluminum coated reflector and two No. 1 Photoflood lamps. The model is seated four feet from the white background while the camera and lights are five feet distant from the model. The Graflex is loaded with an Eastman Verichrome Film Pack.

Focusing at full aperture, the lens has been stopped down to f8. With the four Photofloods, the exposure will be one-half second. The negative will be developed for eighteen minutes in the following Glycin formula:

GLYCIN DEVELOPER

Sodium sulphite	2½ ounces
Sodium carbonate	2½ ounces
Glycin	½ ounce
Distilled water	1 gallon

Use full strength at 65° F. Prolonged development will give greater contrast. This developer will keep for several weeks, and as it ages, the developing time must be increased.

We idealize women as being beautiful, so we must endeavor to produce likenesses that are also beautiful, or at least, beautify the likenesses as much as possible. If Madame Dowager has wrinkles and three chins, then it is up to us to perform painless surgery with the lights, retouching pencil and etching knife.

Nature did not provide madame with her imperfections, rather the lady acquired them through her own efforts and so, as true exponents of nature, we must minimize these defects. We perform the operation of flattery but must not detract from the likeness while so doing.

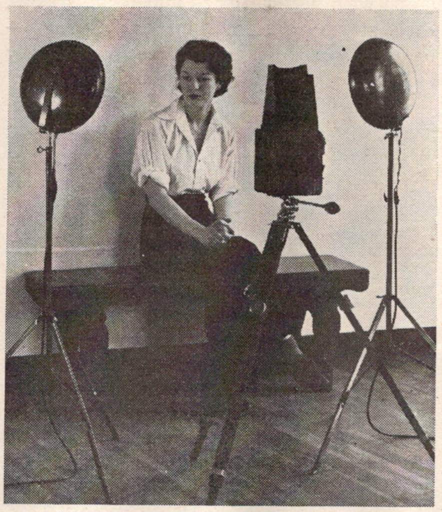


Fig. 1. Elementary placement of lighting equipment for portrait work.

Do not make portraits of the gentler sex too heavy or in low key. Keep them on the higher and lighter plane. Portraits of men should be strong with a powerful play of highlights and shadows. In posing a subject, strict attention must be paid to the background, and in no way must it detract from the model. A background is used to help the story telling value of the picture and assist to pleasingly portray the sitter.

In costume or advertising, photographic backgrounds with definite forms, interesting in themselves may be used—but even then care must be exercised that they do not pull attention to themselves.

For portrait work I use a white ground, a black velvet drop, a mottled green velvet and several lengths of tapestries and brocades. My favorite for the ladies is the white ground with light colored drapings. For men I usually make exposures against both the black and green velvets.

Let us take an example or two for illustration and comparison. Referring to Fig. 2, "Miss Hughes," it is fortunate that I am on rather friendly terms with the subject or she probably would have taken me apart after seeing this print. There is a right and wrong way of taking photographs; a lady with the facial characteristics of Fig. 2 requires careful analyzing before posing and lighting.

Here we have a full round face, slightly upturned nose and a profusion of dark hair. The head pose, with the eyes turned to the opposite direction, is poor composition while the cross-lighting with a split background certainly does not help matters much. The angle of the arm is positively painful to look at. Expressions mean a lot and this young lady is saying plenty, no doubt the rough handling during the process of posing had something to do with her peculiar expression.

Referring again to Fig. 2, we find that a decidedly unfavorable impression has been created by this print and the client is just about ready to go elsewhere for a sitting. Offering our humble apologies, we proceed to pose and photograph her in a manner that past experience has taught us will be pleasing to her and profitable to us.

Placing Miss Hughes against the illuminated white background she is posed di-

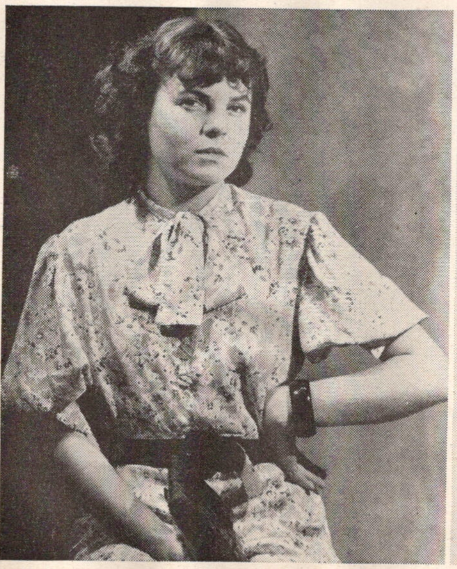


Fig. 2. The result of poor posing and lighting with no regard paid to the contour of the model's face.

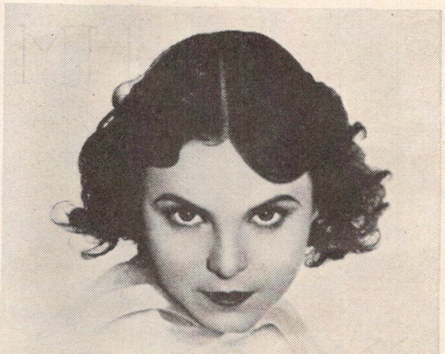


Fig. 3. The same model when correctly handled.

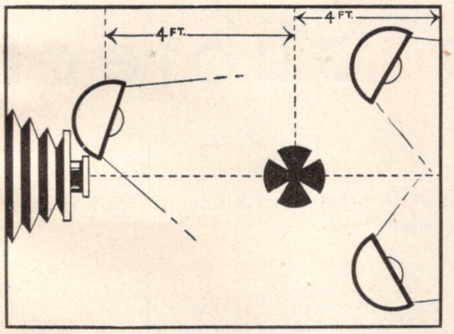


Diagram A. The lighting arrangement in shooting the photograph in Fig. 3.

rectly facing the camera and looking into the lens. Using one photoflood lamp in the reflector, a straight front illumination is directed at her. This light is placed four feet from her and in CONTACT with the camera; the light is raised sufficiently so as to cast a slight shadow on the orbits of the eyes, under the nose and the cheek and chin line.

The uptilt of the nose is overcome by slightly lowering the head, and now we are able to bring out to advantage the salient features; a pair of ravishing eyes, a dainty oval face and the whole is backed by luxuriant unruly hair set against a semi-white ground. The lighting arrangement is illustrated in Diagram A with the result shown in Fig. 3.

Another print is made and one could scarcely recognize that Figs. 2 and 3 are both photographs of the same young lady.

THE above was a problem in full face photography, now let us try a profile. In making a profile keep it such, do not show part of the other eye. Fig. 4 is a study of Miss Gene Hanner, internationally prominent portrait photographer. With Miss Hanner as a model we will proceed to make a portrait of her using the white background and the Contax Camera.

A white background is only as white as the intensity of the light striking its surface. Some of this light is absorbed by the ground while a great deal of it is reflected and this reflected portion is the true value of the background. If no light whatsoever strikes the background, or if the surface of the ground was constructed of materials which absorbed all of the rays of light falling on it, then the white or any other surface under the above condition is black insofar as photographic values are concerned.

For her sitting, Miss Hanner, attired herself in an extreme of contrasts, choosing a gown with vertical black and white stripes, each stripe at least an inch in width—enough to cause stigmatic vibrations to any eyes, human or mechanical!

The problem was to produce, in the finished print, a soft cameo-like effect without any harsh contrasts. Before attempting to pose or illuminate the model, a careful study was made of her features. The full face revealed sagging jowls and harsh lines running from nose to mouth. The hair dress was static, being parted in the center and drawn down in two severe sections on either side of the head. A three-quarter view did not help matters any.

In desperation I suggested placing a screen in front of her and photographing it but she strenuously objected to that idea so I decided on a profile study.

THE subject was seated on a posing stool five feet from the white ground. Two standards, each containing one photoflood lamp, were then placed one on either side of Miss Hanner on a level with her head and about four feet from the ground, care being taken not to allow spills of raw light onto the sides of the subject.

This assured me of an evenly illuminated surface of white, which in the final print, would serve for lettering, adding lines or making any tonal and drapery alterations deemed necessary. A white background illuminated as described in addition to presenting a workable print surface reflects back sufficient light to produce a soft backlighting on the subject.

As this was to be a head study, using the Contax, I placed the camera five feet from

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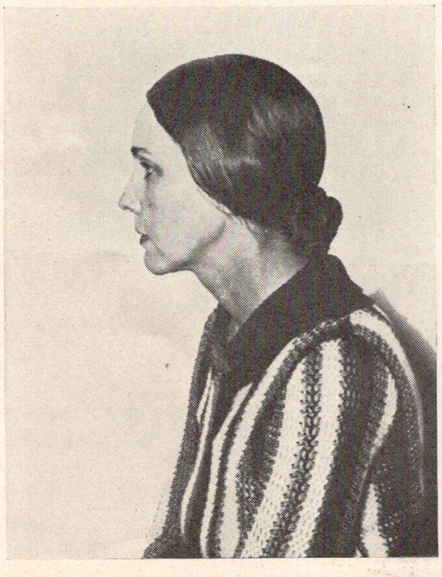


Fig. 4. Miss Gene Hanner, internationally prominent portrait photographer, poses for an example of poor lighting.

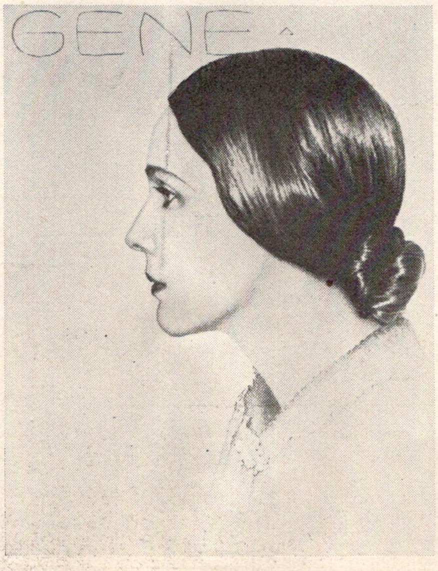
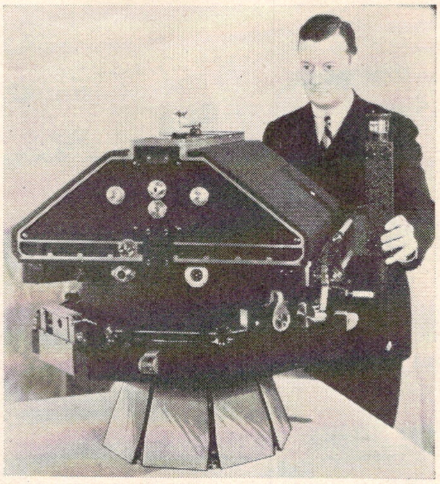


Fig. 5. A few changes and the same Miss Hanner photographs beautifully with all defects remedied.

World's Biggest Aerial Camera



Sherman Fairchild demonstrating his 305-pound new camera.

THE world's largest single unit multi-lens aerial mapping camera was recently completed for the Government by the Fairchild Aerial Camera Corporation. The camera was designed for mapping from a higher altitude than has ever been practical with multi-lens equipment.

The camera has nine vertically-mounted f4 lenses, eight of which have associated steel mirrors of high reflectivity, weighs 305 pounds when loaded, stands 38 inches high, has a maximum diagonal cross-section of 35 inches, and has one large film for all lenses instead of a small individual film for each lens. The weight of the camera and accessories needed for a photographic flight totals 636 pounds. The shape of the camera is like no other ever built; it is unique in appearance, operation and performance.

The nine lens type of mapping camera has a number of outstanding features:

It is fully automatic and can be loaded in daylight.

After the camera is in operation, the photographer merely has to keep the camera level by means of two spirit levels.

It will cost 25 percent less than present equipment to operate.

The need for adjusting radial plots, a highly expert and time-consuming laboratory procedure by which photographs are assembled into mosaics in accordance with ground control points, will be largely eliminated.

It has 4½ times the stereoscopic parallax of the single lens and five lens camera, making it practical to extend the advantages of stereoscopic mapping (securing contour maps from aerial photographs) to more level terrain than is possible with present equipment as well as reducing the cost of topographic mapping considerably below present levels.

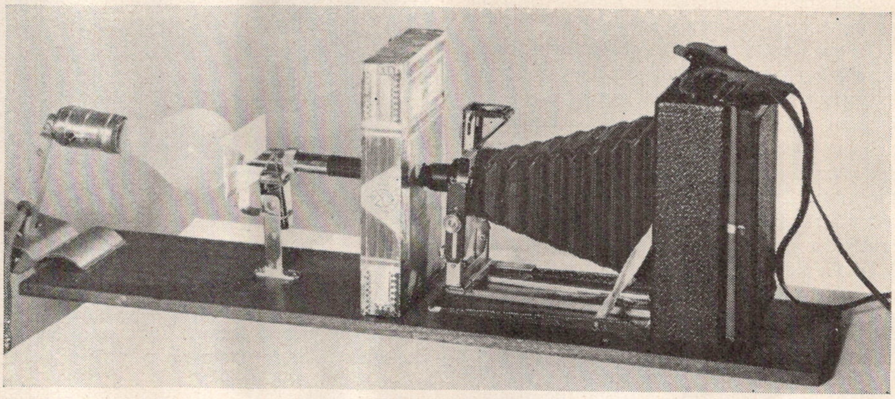
From a working altitude of 30,000 feet above sea level the camera can cover about 600 square miles at one simultaneous operation of all nine lenses.

A more detailed discussion of aerial cameras and their use in mapping will be found on page 47.

Microphotography for the Amateur

By J. G. JONES

There's fun and education in this simple home equipment for taking microphotographs. A pocket microscope, an old camera, a cigar box and a board will give you a good start in a most interesting field of photography.



The practical equipment illustrated above costs less than $10.00 plus camera.

IF YOU'RE looking for something to take your mind completely off your surroundings and your work-a-day problems and to open a brand new private world all your own in photography, try "microphotography."

What a long scientific-sounding word! It's enough to scare away any amateur photographer until he gets into it and discovers how really simple it is. I did, and I'm rather swelled up with (pardonable, I hope) pride in what I've accomplished—not that my results are anything to have the professional "microphotographer" gush all over with praise, but because

1. I'm just a plain ordinary everyday amateur.
2. Nobody ever gave me any clues or instructions about taking "micro" pictures—and I didn't even read up on it.
3. My equipment is a lot of odds and ends of home-made stuff that I put together myself.

If you're tired of taking pictures of dogs sitting up to beg, or pictures of chummy groups of people who insist on wearing that "posed" look, or still life pictures of apples and bananas, or, worse still, if you just can't find the right subject for "something different," try micro pictures.

I "discovered" microphotographs after the camera bug hit me so hard that I had taken pictures of everything in my apartment (in which nobody, by the way, seemed to express the least interest) and I was still looking for something exciting to do with my camera in the evenings.

It started this way. I have a pair of binoculars and I have a microscope. The binoculars had long since been taken apart to find out what made them work, and somehow I never could put them together again. The microscope is one of those pocket affairs—a little larger than a good-sized fountain pen. I bought it once for only $6.

I began experimenting with both the binocular lenses and the microscope to try to get them to work together with my camera. I didn't have any luck with that, but, for one thing, I found out that I could put one of the binocular lenses on the camera to get pictures of small objects in either actual size or one and one-half times actual size. But that's another story that I may tell you some time.

The microscope fascinated me and I had my heart set on getting what I could see through the microscope to register on a negative. My microscope enlarges things up to 120 times and shows some surprisingly beautiful formations in the most ordinary objects—sugar looks like big diamonds, tobacco grains look like beautiful rocks, closely woven silks show every fibre of their threads, silk stockings have loops as big as chicken wire, and so on.

My microscope has no stand or support. I merely rest one end on the object and look through the other end. A knurled section near the bottom may be turned to bring objects into sharp focus.

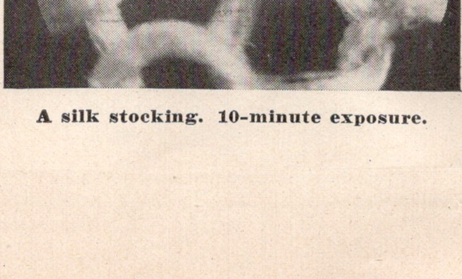
There's nothing elaborate about my camera, either. I bought it second-hand about five years ago for $10.

It's a bellows camera with an F-8 lens, uses film packs and has a ground glass at the back that you get to by opening a little door. It has the usual reflector view finder, but focusing can also be accomplished through the ground glass simply by removing the film pack. I'm mentioning these things to emphasize that my "equipment" is most ordinary and not of the elaborate and expensive variety that you would think would be necessary for taking microscopic views.

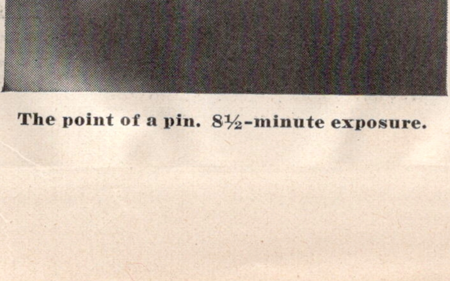
I won't bore you with all the things I tried in order to make some things show through the microscope on to the ground glass. Nothing that I focused the microscope on seemed to show through to the ground glass. Finally, in a last try, I held the microscope on a lighted electric bulb with the camera lens held against the eye piece, and it worked! A sharp large circle of light showed through to the ground glass.

There was my clue—it took a tremendous amount of light for an image to travel through both microscope and camera. All I had to do (so I thought) was to somehow fasten the microscope on the camera lens, put something between the end of the microscope and a strong light, and there I was!

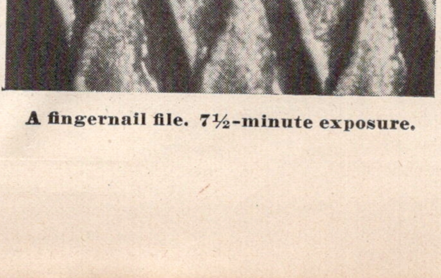
I went to work with a lot of energy and anticipation to rig the thing up. The photograph of my (humorously called) "equipment" is shown with this article. A board is the base; a cigar box with holes through it holds the little microscope parallel with the board. With the aid of a curtain rod bracket, a few paper clips, a piece of brass with a hole in the end and a lot of rubber bands, I had a spring holder which would



A silk stocking. 10-minute exposure.



The point of a pin. 8½-minute exposure.



A fingernail file. 7½-minute exposure.

hold a piece of glass rigidly in position against the microscope's end.

But I was elated too soon. I did find that by placing a light so as to shine through the microscope and having a piece of transparent material on my piece of glass, I could transpose an enlarged image of my transparent material on the camera's ground glass. That was all right if what I wanted to picture was transparent, but I was more ambitious than that. I wanted to photograph whatever I could see through the microscope, whether it was transparent or opaque, and I could see plenty.

When I placed a metal object or, in fact, anything opaque in front of the microscope, it simply wouldn't show through to the ground glass, no matter how I lighted it or how long I perspired under a cloth hood and stared at the glass. If I couldn't see the thing, how was I to focus it? Well, after I solved that weighty problem, it was really funny how simple it was.

In the first place, in fooling around with the focusing of *transparent* objects, I found that when I once got the microscope in sharp focus, the enlarged view always registered in correct sharp focus on my camera's ground glass. Moving the camera away from the eye piece of the microscope, or moving the camera lens back toward the film end of the camera, or closing the diaphragm all had the same effect. All of these operations merely reduced the amount of the area of the image which was thrown on the ground glass. They didn't change the sharpness of the image in the least, and didn't photographically reduce the image. (A leading manufacturer of microscopes suggests that the camera be focussed at infinity for sharpest results.—Ed.) Doing these things only reduced the *amount* of the object which would photograph—they had no other effect. When the bellows of the camera was extended to its full length, the diaphragm fully opened and the camera placed almost touching the microscope's eye piece, the reflected image was as large as I could get it.

Well, there was my answer—all I had to do was focus the *microscope* correctly, set the camera up to the eye piece and I was all ready to make the exposure. By a little experimenting, I discovered the exact spot to set the camera so that the reflected enlarged image would be centered on the negative, and I marked its position on the board which held the microscope in position.

Now for the way I make my pictures. The piece of glass at the end of the microscope is my stage. On it, I fasten a piece of cloth, a piece of a leaf or anything that promises to have an interesting pattern or formation worth recording on a negative. The glass stage with its object must be held rigidly in place parallel with my negative. I then place a light—I use an ordinary 60 watt bulb—very close to the object and focus the microscope to get it as sharp as possible.

When the view through the microscope is what I want, I set the camera lens up close to the eye piece of the microscope in the position I have marked on the board and make my exposure. Incidentally, I

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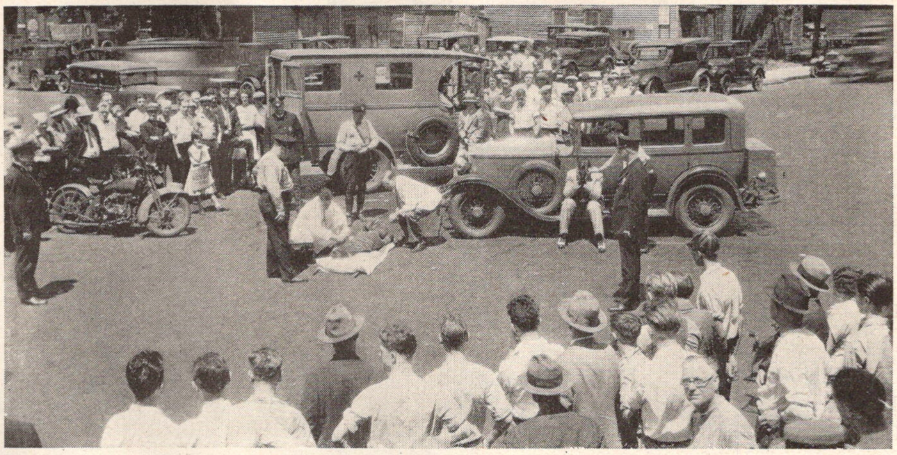
An Accident! Faked or Real?



A big crowd but only one paid model. Can you find her?

THIS accident looks absolutely genuine. Yet the whole scene is faked and out of 75 people in this prize winning picture there is only one paid model!

Staging a scene of this character with all professional models would involve not only a tremendous cost for model fees, but the abilities of a movie director and his many assistants. All credit goes to the Gerald S. Beskin Advertising Agency, Inc., of Minneapolis, not only for achieving an excellent result, but also for replacing great cost with clever planning.

Beskin reports that to stage this scene, he sought and obtained the whole-hearted cooperation of the Minneapolis Police Department and the Minneapolis General Hospital.

Ambulance surgeons went to work on a prostrate figure presumably struck by the automobile shown at the right. Police rushed up and began an investigation. An unfortunate "speeder" buried his head in his hands as he slumped down on the running board of his car.

And what happened? The usual thing. Traffic stopped. People came rushing up from all directions to see what was going on and were held back by the police "to give the victim air."

When the assembling crowd became large enough (a matter of only 20 minutes) Beskin gave the signal—"click"—and the camera of the Graphic Arts Studios, commercial photographers of Minneapolis, made the exposure. Nobody in the crowd except the actors suspected that the scene was faked.

Have you discovered the paid professional model in the picture? You will probably have trouble in finding the answer—it's the woman on the stretcher. Although she's the only paid actor in this drama, it's amusing to note that wrapped up in a blanket, she's about the only one who can't be seen!

How Not to Join a Camera Club

By Vic Johnson

AMATEUR photographers sorely need some form of hardener or desensitizer to guarantee immunity against the urge to spend the Family Income on the One Great Hobby. With show windows and display rooms crowded with glittering arrays of minicams, ruck sack cameras, lenses, filters, enlargers, films, papers, developers, exposure meters and "must" gadgets, the budget is in Grave Danger and something should be done about it.

Until such remedies are available, other means must be used and this genuinely helpful article sets forth a few of these. They should be clipped and kept for use when an emergency arises.

The simplest plan is to make a pair of blinders somewhat on the order of those used to keep skittish horses from shying at derby hats or other unfamiliar objects. These need not be elaborate, in fact a very serviceable pair can be made from cardboard. They can be conveniently carried in the coat pocket and slipped on under the hat when passing camera stores. Women may desire to make them in pastel shades, or decorate them according to the prevailing mode.

Another very desirable device is the so-called "ear plugs" used by swimmers. These can be purchased at any drug store for a small sum, or fashioned from sponge rubber. They can be kept in the vest pocket or the vanity and inserted unobtrusively when talking with friends who display symptoms of having recently purchased new photographic equipment.

Simpler than either of these is to cultivate the habit of walking in the middle of the street. This may, of course, cause some unfavorable comment by the motoring public and result in some confusion at busy intersections, but desperate diseases require desperate remedies.

Crowds should by all means be avoided. The photographic epidemic is very widespread, it is no respecter of persons, one

(*Concluded on page* 70)

Taking Pictures Without a Camera

by EMILE C. SCHNURMACHER

A new popular sport enjoyed by amateur and professional alike. Unusual effects are secured without special equipment or materials and really beautiful decorative designs can be obtained by this method.

FOR the past several weeks I have been experimenting with a novel type of photography which requires neither a camera nor film and which has yielded some uncanny imaginative and futuristic effects. It also had the satisfactory effect of baffling several professional photographers to whom I have shown finished prints.

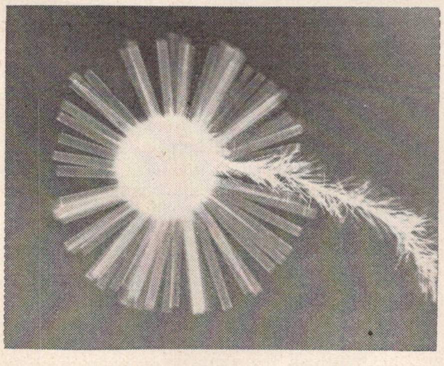
To this illegitimate child of the science of photography I have given the name of "light-ray" photography because the "camera" is nothing more expensive than a simple battery flashlight. The necessary equipment is simple and easy to obtain; and the process is so easily grasped that after reading this article you will be able to turn out some pretty spectacular light ray photographs yourself.

Take an ordinary water tumbler and put it on a table in front of a sheet of white paper. Now turn out the light in the room and turn your flashlight on, standing so that the light rays shoot through the tumbler and on the white paper. Notice how weird the outline of the tumbler becomes? Move the flashlight up and down, then nearer and farther away from the tumbler. Notice how the shape changes? And if there are patterns etched in the glass, they, too, will take on fantastic shapes while even a drop of water remaining in the tumbler will be faithfully recorded.

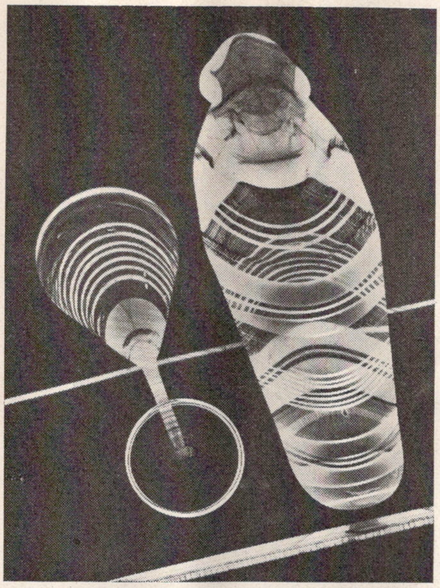
Now add to the effect. Hold an ordinary comb in front of the flashlight as you shoot the rays toward the tumbler and note the complex pattern. Doesn't the design seem intriguing enough to make an unusual picture? All right! All you have to do is to substitute sensitized paper for the ordinary white sheet, the design will register on it and when you develop your paper—there is your light ray photo!

After practicing this a bit, you are ready to start making pictures. To do so, I recommend the following simple equipment:

1. A flashlight battery.
2. A tripod—you may want to study the effects of the designs, etc., for several seconds before taking the picture, hence a tripod is handy. The flashlight battery may be taped to the tripod head.



A lovely moonflower, thanks to a Christmas tree ornament and cellophane.



Don Wallace, famous pictorialist, tries his hand at lightray photography with the result shown above.

3. Ordinary developing and fixing baths for 8 x 10 prints.
4. Several sheets of 8 x 10 contact paper. Get the slowest paper you can buy and do not use enlarging paper which is much too fast.
5. An extension cord for your red light. Since you can take your light ray photos under red light an extension cord is handy. You can make your setups and study them under the red light, then when you are ready to shoot, you turn on your flashlight.

And that is about all you need, except for the various glass tumblers and other things which you wish to photograph. To give you the idea in detail I take you step by step through the various photographs accompanying this article.

The moonflower (figure 1) is nothing more than an ordinary Christmas tree ornament bought in the five and ten cent store. Here we place the ornament in front of the white paper and flash on the battery.

When we get the type of shadow which is most interesting, by moving the flashlight either horizontally or vertically, we turn off the light rays and flash on our red working light. Now the package of sensitized paper is opened and a sheet is placed over the ordinary white paper in exactly the same position. The picture is almost ready to be taken.

If, however, we want to add a stem or leaves to the moonflower, we drop some tinsel or twisted cellophane from a package of cigarettes on the sensitized paper where the shadow shows it would be logical for a stem or leaves to be.

Now we take the picture. The time varies according to the power of your flashlight battery as well as the distance which it is placed from the table. Ordinarily this would be somewhere between five and ten seconds, but a little experimenting will show you the exact timing to give it. The sensitized paper is then developed and fixed just as an ordinary 8 x 10 contact print would be.

In similar manner you may make many imaginative pictures, using such objects as the following, which will give you unusual effects: Xmas tree ornaments, glasses of all kinds, cut glass bowls, paper doilies, forks, etc.

And now let us look into the secondary process by which pictures may be made showing flying airplanes, swimming fishes, etc., etc. Here we simply add the principle of the silhouette to our light ray photography.

Let me explain this by telling you how the "undersea" picture of "Ten Fathoms Down" (see below) was made. Not with a diving helmet and elaborate apparatus, but in comfort on top of an ordinary bridge table.

First of all, I cut an ordinary sketch of a fish out of a magazine and pasted it on one of the 8 x 10 black envelopes in which photographic paper is sold. Then with a small pair of scissors I cut out on the outline of the fish.

I was now ready to make the impression of the fish on the sensitized paper. To do this, the sensitized paper was slipped in the envelope so that only the white silhouette of the fish appeared. Naturally, if I trained the light ray on the exposed sensitized paper, the black silhouette of the fish would appear after the paper was developed.

But just a second—we want something more than a silhouette. We want black and white gradations of tone. That was easy. I simply placed a whiskey tumbler

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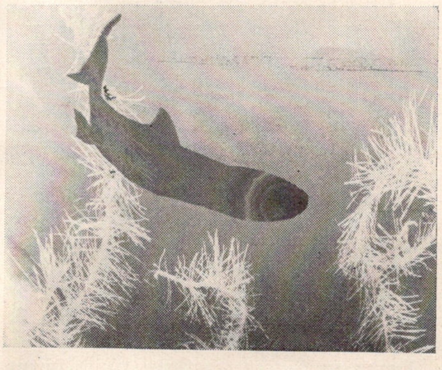
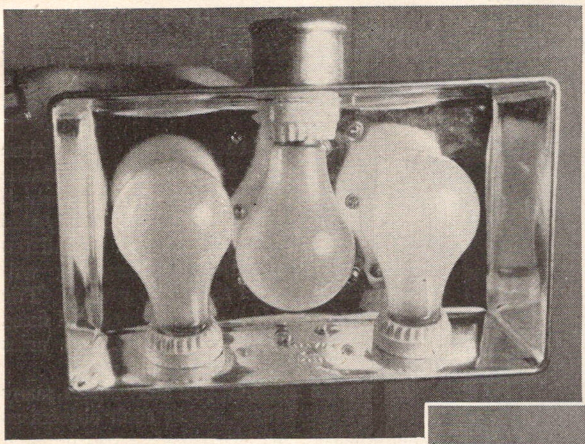


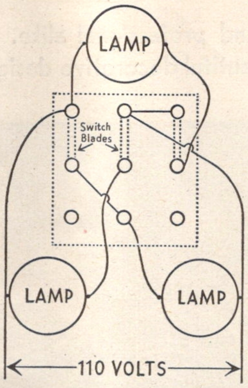
"Ten Fathoms Down," an undersea design taken on a bridge table without a camera.

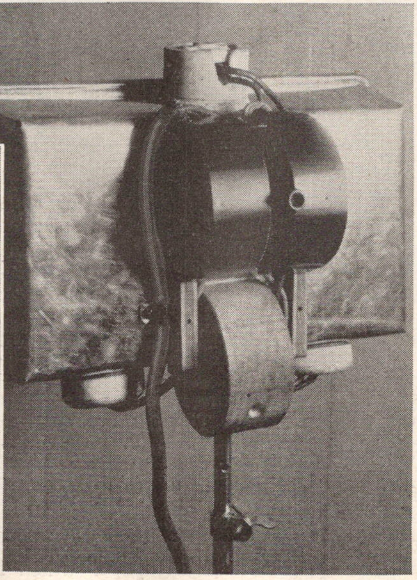
Building a Photoflood Unit

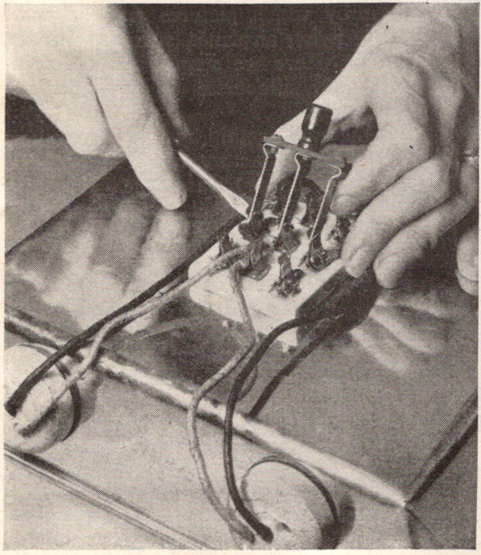
by Walter E. Burton



Above. The completed photoflood lamp with 3 bulbs employed. Effective illumination, 2250 watts.







Above. Rear of lamp unit showing switchguard and circular mounting block. Upper right, wiring diagram.

Left. A 3-pole, double-throw knife switch is used for controlling 3 photoflood lamps.

SMALL photoflood lamps, which have brought a new era of indoor lighting to the amateur movie and still photographer, have a life of about two hours when burned at a voltage of 105 to 120.

In two hours a photographer can make many hundreds of exposures; but it is not exposures that eat up the light, it is focusing and arranging the subject for best lighting effects. With the lamp unit shown, which you can build at small cost, you can burn the photoflood bulbs at reduced brilliancy for focusing, then switch them on full strength for a few seconds while the exposure is made. In this way a set of bulbs will serve the average amateur for months.

The unit employs three No. 1 photoflood lamps, and therefore gives a maximum illumination equal to that from ordinary lamps which consume a total of about 2250 watts; but each lamp draws only about 250 watts, or a total of 750 for the unit. No. 1 photoflood bulbs cost 25 cents each.

During exposures the three lamps burn in parallel; but for focusing, two of them burn in series. This reduces the light output for the two lamps, but prolongs their life. If all three bulbs are not needed, the upper one of the unit can be removed or unscrewed far enough to break the contact.

The lamp house or reflector is a tin baking pan costing ten cents and measuring 6½x10½ in., with a depth of 2¾ in. You will need three porcelain screw-ring sockets, for medium-base lamps. The type having pigtail connections is preferable. Some ten-cent stores stock these. The remaining major item is a triple-pole, double-throw knife switch that can be obtained for about 30 cents. Then, of course, you will require some small 3/16x¾ in. bolts with nuts and washers; a number of ½-in., round-head wood screws; a small quantity of wood; 10 to 15 ft. of heavy-duty lamp cord with plug; and a stand. The last item can be a folding music stand, such as the kind usually employed for small light units.

With the longer sides of the pan horizontal, mount two of the sockets in holes cut in the lower side, placing them 5½ in. apart between centers, and as near the pan bottom

(*Continued on page 67*)

Question and Answer Department

H.L.M., Providence, R. I. I understand that a focal-plane shutter is more efficient in the control of light than the more usual type of shutter placed in the lens. Please tell me the reason for this action, if true, and give me the numerical value of the shutter efficiency.

ANSWER. It is true that the focal-plane shutter is more efficient than the "between lens" type. It has an efficiency of about 99-percent. while the efficiency of a four-leaved between-lens shutter only reaches 75-percent. The simple fan-type shutter used on low-priced box cameras has an efficiency of about 30-percent.

When the slot of the focal-plane shutter passes across the film, the light is not obstructed at any time, hence the efficiency is very high. When the between-lens shutter operates, however, the lens is never fully opened except during an exceedingly brief interval, hence the full opening of the lens is not utilized.

H.S.W., Milwaukee, Wis. I have had some difficulty in determining the proper exposure for Dufaycolor and Kodachrome because I am confused by the light meter readings. I use a meter with success on black and white films of all types.

ANSWER. You do not say what type of meter that you are using, therefore we will give you two constants that agree with the majority of meters used in this country. Most meters, with the exception of the Weston photometer record emulsion speeds in terms of the Scheiner Degree. When using the color films mentioned, the meter should be adjusted to approximately 18-Scheiner. With the Weston meter, the emulsion speed is 8. These figures are approximate as the color films are affected by the manner of lighting as well as the intensity of the light. Color films require much more accuracy in exposure than black and white.

C.L.M., Boston, Mass. I have a small . . . candid camera with which I am having trouble. The pictures are not nearly so sharp and clear as those previously obtained with a cheap box camera. There are so many adjustments to make with the new camera that it is difficult to tell which adjustment is wrong. Please advise.

ANSWER. Undoubtedly, your camera is not focused properly for the different distances of the subject. This did not trouble you when you were using your box camera because the focus was fixed and, therefore, I advise you to start using your new camera like the old box camera with a constant focus and practice this until you get accustomed to the new camera.

To do this, open the camera and turn the focusing lens cap until the pointer indicates 20 feet. Now, adjust the diaphragm until it shows an opening of f11. With this adjustment, in full sunlight, everything will be in focus between 9.5 feet and infinity and there will be no necessity for making further adjustments for any object inside of these limits. If the stop is reduced to f16, everything will be in focus between 6.5 feet and infinity, but super-sensitive film will be required for snap-shots even in full sunlight.

(*Concluded on page 68*)

Don English, specialist in movie star portraits.

Don English—Hollywood's Ace Still Man

by CHARLES CARSON

THIS biography of one of Hollywood's prominent and successful photographers will come as a surprise to most of our readers because he is a "still man" and not a movie camera cranker.

And further, this story is full of inspiration for those who have wished to crash the gates of Hollywood, photographically speaking, for Don English, our hero, advanced to his present eminence from the job of newspaper photographer.

FROM solving murders in San Francisco's Chinatown to photographing stars in Hollywood is a long call, especially when the distance is spanned in one stride. Yet, that is the experience of Don English, Paramount Studio's ace cameraman.

This young chap probably knows more about the private lives of certain screen stars than anyone in Hollywood, but he doesn't talk—a trait that has won for him the confidence and personal friendship of every luminary he has ever photographed.

He is equally reticent about himself, which accounts for the fact that this interview is the first he has ever granted for publication.

"My first experience in the work was at the age of ten," said English. "My father arranged a miniature laboratory for me in the basement of our home and I used to take pictures of kids in the neighborhood and develop the films in my improvised 'dark room.' I must have had photography in my system, for I found the urge to take pictures creeping back on me, after I had been away from it for years."

Back in 1921 English was employed by the Pacific Gas and Electric Company, in Oakland, California. Notwithstanding his good position, which offered opportunities for advancement, he left the gas company to work with a commercial photographer, who paid him a salary so small that it hardly enabled him to meet living expenses.

"But it wasn't the salary that attracted me," English explained. "It was the chance to learn the work. For two years I stuck it out; then came my first opportunity. The fellow I worked for was doing news photography for *The San Francisco Chronicle* on the Oakland side of the Bay, and it was through him that I finally graduated into newspaper work."

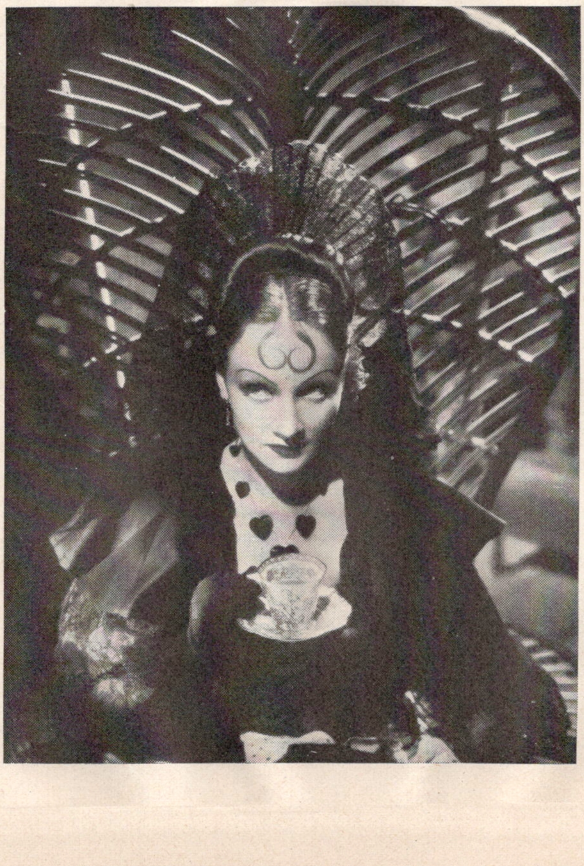
From there his rise was rapid. Within a few months he was doing regular news work for the *Chronicle* in the San Francisco district, covering police cases. He soon became the nemesis of crooks throughout the Bay district. Police looked upon him with admiration, and the *Chronicle* gave him a raise in salary.

On any case that required instant action, Don English was called upon to deliver. In some way he always managed to arrive on the scene of a crime ahead of other photographers, and in some instances ahead of the police. The keen lens of his camera seldom failed to record some form of telltale evidence, which always interested newspaper readers and incurred the hatred of the culprit.

In San Francisco's colorful Chinatown, in the better residential districts, on what was once the infamous Barbary Coast, people gradually came to know this intrepid young photographer. Both those who envied him and those who had good reason for hating him recognized and respected his presence.

After three years with the *Chronicle*, the *San Francisco Examiner*, recognizing the value of his services, offered him a salary that might have staggered the ordinary news photographer. He accepted, not only because of the fabulous salary, but also because of the wider scope covered by the new position.

This charming photo of Marlene Dietrich is an example of the superb craftsmanship of Don English. He has adopted a very effective pose and lighting.



The *Examiner* equipped him with an airplane and a pilot to fly it, enabling him to take pictures on land, sea and in the air. When William Edward Hickman, the notorious killer, was captured in Oregon in December, 1927, English immediately flew north and covered the case before the police had time to return Hickman to Los Angeles, where he was later sentenced to die on the gallows.

On August 16th, 1927, entrants in the famous trans-Pacific Dole flight, sponsored by the Hawaiian pineapple king, set out from San Francisco for Honolulu. English was on hand to photograph the flyers, and escorted them beyond the Golden Gate to bid them *bon voyage* and wish them well. Unfortunately, good wishes were not sufficient for a happy landing, as several lives were lost.

In 1929, an amazing thing happened in aviation. A Zeppelin was circling the globe for the first time in history. Don English was assigned by W. R. Hearst to follow the Graf Zeppelin's movements during the stop in San Francisco. He was the first to spy the huge airship floating over the Golden Gate and, with his plane, welcomed it to the United States.

Practically all of the trans-Pacific flights, including that of Captain Kingsford-Smith, were covered by this well known photographer, making him a nationally known figure in newspaper circles.

In 1929 he was sent to Del Monte, California, during the Bobby Jones golf tournament. It was while there that he received a wire from Paramount Pictures in Hollywood, requesting him to telephone them at once, collect. Supposing that they merely wanted to give him some extra work, he declined to answer. It was only after he had received the third telegram that he decided to call them. The result was a permanent and lucrative position with this company where he has steadily advanced to his present position as the best known still man in pictures.

He is a dapper young fellow, slightly resembling the motion picture detective type in appearance. He is pleasant and affable, willing to talk about anything or anyone, except himself and the stars he photographs. On those subjects he is likely to balk.

One of his triumphs was his singular ability to photograph Mae West to her own liking when she was at Paramount. "The guy knows his business," Mae used to tell executives, "and as long as I have my way around here, he's going to take all of my pictures that's took."

Marlene Dietrich and Carole Lombard have an equal respect for Don, and neither of them will pose for other still men when he is available.

His popularity caused a near-altercation recently, when Carole Lombard was making a picture at Universal Studios and insisted upon her favorite photographer being present. Don himself is mum on this subject, though it is general knowledge among the studio personnel. He is in the employ of Paramount and, technically, cannot be forced to work on another company's lot, but it is also a fact that stars have a way of getting what they want. In this case Miss Lombard wanted Don English, and she got him—as her photographer.

A similar incident occurred when Marlene Dietrich was making *The Garden of Allah* for RKO-Selznick. She requested the services of English, which the company declined as a matter of course. Her request became a demand, which was likewise refused. But studio officials soon learned who was wearing the pants, and Fraulein Dietrich again got her man.

When asked about these incidents, Don merely smiled and said, "Well, I guess they do like my work." Beyond that he would not commit himself.

Don, after considerable prompting, did offer a few tidbits for the readers of Popular Photography. Claudette Colbert, he revealed, is one of the favorites of the Paramount cameramen. Miss Colbert's technical knowledge of photography enables her always to strike the right pose with no apparent effort. Fred MacMurray is considered a "natural" for the still camera and Jack Benny photographs so well that the "boys" on the Coast think his real place is on the screen rather than the air. Gary Cooper is another subject of Don English and a personal friend as well.

He does not believe that there are any secrets in attaining success. "If a fellow has it in him to advance, he will find a way to the top. I believe that, first of all, one must have a natural liking for the work. If one has that, plus a reasonable amount of persistence, he will likely succeed. If he doesn't like it, there is no remedy for that.

One of Don English's favorite subjects, Claudette Colbert.

Gary Cooper, both friend and subject of Don English.

"I don't see where I have accomplished anything unusual," he continued. "Any young man with an average intelligence and a reasonable amount of curiosity can do all that I have done. If a fellow has no curiosity, no desire to find out what a machine is made of or what a piece of work is going to look like when finished, he will never get anywhere.

"I hear a great deal of talk these days about ambition. Personally, I don't think much of it, probably because I have never had it. I have no desire to be rich or famous; my worry has always been to find out exactly how a certain type of picture is made and then go and make it."

That is Don's philosophy of success, in a nutshell. His statement that fame and fortune mean nothing to him is attested by his everyday life. Success has not turned his head. He dislikes publicity and has little regard for money. His one ambition—if we may call it ambition—is to make pictures as nearly perfect as possible.

Aquarium Photography

WHEN you shoot fish in a public aquarium you will need a box that is 100% camera—plus. There isn't much kick to the light after it filters down to eye-level through ten or fifteen feet of water and then, in addition to this deficiency of light, we require a rather high shutter speed to take care of the rapid movements of the fish.

After a whole lot of experimenting, under all sorts of conditions, it has been found by the fish fans that the minimum possible lens speed for public aquarium work is f2.0 and preferably f1.5 with a shutter speed of 1/50 second. And even at that, with the lens wide open you'll not be annoyed with any over-exposures on a Super-"X" film.

Coming! The next issue of POPULAR PHOTOGRAPHY will feature a brilliant article by Charles Miller, world famous explorer and movie cameraman. Mr. Miller will relate some of his exciting experiences in the jungle and will demonstrate by lighted model and charts some vital principles of good motion picture technique for the amateur.

Care of the Front Lens Cell

STRANGE to say, the front cell of a camera lens is not much affected by what would appear to be glaring defects. The very high grade lenses made of the exceedingly soft borate glass may, for example, be filled with a maze of bubbles which do not interfere in the least with the action of the lens but which appear as serious blemishes. In fact, the presence of the bubbles, as long as they do not break through the surface, is apt to indicate a high grade optical glass.

In the same way, quite large chips may be taken out of the front edge, if around the edges, without injuring the lens in the slightest degree, but if the lens is deeply scratched or covered with discolored patches, then it is another matter. Dirt, finger-marks, scratches or corrosion leave their marks on the plate or film and must be carefully removed. On the other hand, the lens must not be cleaned too frequently because, in the course of time, the surface will be covered with a maze of fine scratches that reduce the transparency of the lens in much the same manner that grease and dirt reduce the light transmitting ability.

When in perfect condition, a well polished high grade lens is practically invisible. It is only when the lens is covered with dirt, grease or fine scratches that it becomes whitish or strongly visible.

For cleaning a lens, a soft washed linen handkerchief is a safe and effective medium. Still better are the special lintless lens papers, but before we use such papers we must be sure that they are free from mineral or other hard matter that might scratch and injure the lens. It is the best and safest policy to keep the lens covered with a velvet lined lens cap when not in use, thus reducing the amount of dirt on the lens surface and the number of cleanings necessary. Each cleaning offers an opportunity for scratching, particularly if the dust and grit is not first brushed off the lens with a camel's hair brush before the actual cleaning begins.

The use of water and particularly alcohol is to be avoided as both these liquids attack the lens mount lacquer and deposit a thin film of lacquer upon the surface of the lens.

A Hospitable Zoo

BROOKFIELD ZOO, Brookfield, Ill., a suburb of Chicago, has one of the largest and most attractive zoological collections in the world and, strange to say, welcomes the amateur photographer.

The welcome extended to the snapshooter is most unusual for a privately operated self-supporting exhibition and includes the sale of film, rental and sale of cameras and other accessories necessary for photographing the animals. The old idea that amateur photos affect the sale of postcards and catalogues issued by the institution has long ago been dismissed and it is believed by the officials that pictures made by the visitors are among the best publicity features yet developed. Other zoos are invited to take notice.

My Experiences as a Model

by NAOMI ANDERSON

Is a model's life hard or easy; pleasant or unpleasant? The author, a popular young model tells how she came to take up modeling as a profession and relates her interesting experiences while posing for various photographers.

"BUT, my dear! A professional model! It doesn't seem quite—well, quite proper for you. Are you quite sure, Naomi . . ."

Yes; I was quite sure. I had decided to become a model, and my mother's qualms would not deter me.

Please understand, my mother is neither prudish nor puritanical—she is, in fact, very liberal-minded—but, like a great many other people, her conception of a model was analogous to that of a "strip-teaser" in a burlesque show: a brazen girl who would boldly disrobe and pose nude, or almost nude, for any man who paid her. Naturally, the thought was abhorrent to her; and thus, when I told her of my intention she promptly registered her objection.

Nevertheless, I had made up my mind to be a model, and a model I was going to be.

The idea first struck me when I was employed as a secretary in the Administration Building of the Chicago World's Fair. Cameramen from the Chicago newspapers were in our offices every day, and almost every day I would be asked to pose for them in some publicity stunt.

And when I saw my picture in the papers, holding a flag, or pointing to a medal, or presenting something to a distinguished visitor—doing any one of a dozen different things—it came to me that if the newspapers thought my photograph attractive enough to publish, the commercial studios might think so, too.

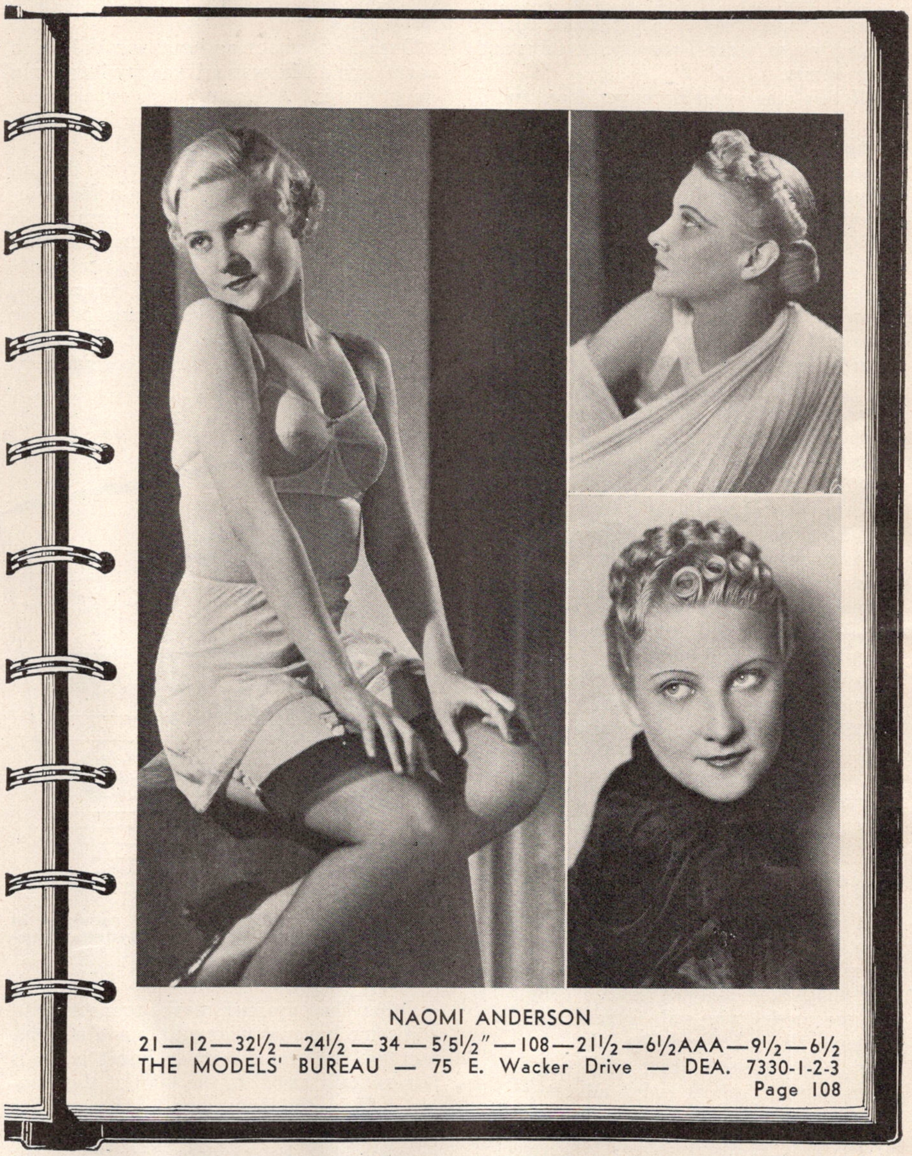
"So why," I asked myself then, "shouldn't I be a *professional* model instead of an amateur, and get money for my photographs?"

It was easy enough to ask that question, but not so easy to answer it. How did a girl go about getting such employment? I hadn't the faintest idea. I knew nothing whatever about professional posing, nor whom to ask about it, nor where to look for a job.

And I probably never would have known—and would be taking dictation in an office today—if a friend hadn't casually mentioned to me, toward the end of the Fair, that the *Herald and Examiner* was planning to illustrate a serial with photographs and wanted a girl to pose as the heroine of the story. He thought that I might fit the part. Would I care to see the editor about it?

Would I! I taxied to the *Examiner* office in a hurry and saw the editor. He interviewed me and measured me with a calculating eye, and decided I would do. I was hired on the spot, and next day I started to work.

Among the others posing for the story was a professional model, and when I told her of my ambition and asked her, somewhat timidly, how one got started in her profession, she said:



NAOMI ANDERSON

21—12—32½—24½—34—5′5½″—108—21½—6½AAA—9½—6½

THE MODELS' BUREAU — 75 E. Wacker Drive — DEA. 7330-1-2-3

Page 108

An actual reproduction of Miss Anderson's listing in the Models' Register, used as a guide by professional photographers in selecting models. The numbers below her name represent the model's age and personal measurements.

"The best way is to register at Seaman's Models' Registration Bureau."

So, as soon as we were through posing for the newspaper serial, I called on Mrs. Seaman, and she handed me a card to fill out. On the card I answered the printed questions about my size, height, weight, age, color of hair and eyes, shoe and stocking measurements, and the size of my bust and hips. She filed the card and said I would hear from her when she had a call for a girl of my type.

I went home and waited. Followed a period of doubt and uncertainty. And then, just as I was becoming resigned to the thought that the whole thing was hopeless, I heard from Mrs. Seaman, and—almost before I knew it—I was launched on my career as a model.

My first job was at a fashion show in the Merchandise Mart. The manager said I was too short for a successful dress model (I am five feet five and weigh only 110) but she added if my legs were shapely enough I would do very well as a page. . . . Well, I became a page.

My experience at the style show—my first public appearance as a model—was most exciting, you may be sure, and when I went home that night, with a check in my purse, I was thrilled. For the first time I had actually been *paid* for showing my face and figure in public!

My next assignment was for the Hairdressers' Convention at the Sherman Hotel.

A number of hairdressers were competing for prizes, which were awarded for originality and the attractiveness of their models, and I entered the contest—and have since been a model for them every year, at each of their annual conventions in March.

After that, came other conventions: Sporting Goods, when I posed in knickers, in riding habits, in bathing suits and tennis shorts; Florists, where I was literally buried in huge masses of fragrant roses; Confectioners, when I munched candy; and many others.

All this was valuable experience, and I was rapidly gaining self-confidence and learning that impersonal poise which is the hallmark of the professional model.

And then came my first experience at posing in flimsy underclothes.

This was what my mother had disliked—what *I* had disliked, too—and I must confess that the thought of posing that way before a strange man made me quite nervous and I flushed with embarrassment.

And then, when finally I stood there, I saw that the photographer wasn't seeing me as a *woman* at all, but merely as part of the day's work. To him, I was just something to be photographed, nothing more.

I reminded myself that I had gone into this thing with my eyes wide open, as a means of making a decent living; and when I saw that to him it was also a matter of business, and nothing else, I forgot my mortification, smiled at my squeamishness, and went ahead and posed.

Today, I pose wearing only the scantiest of underthings—with the same impersonal professional feeling as I do fully clothed.

It's strictly business to both of us—the photographer and myself. Neither of us has any time or desire to think of it otherwise. He's paying me for my time, and I am supposed to earn my pay. It's all impersonal and matter-of-fact. The element of sex doesn't enter into it at all.

Of course, there are pseudo photographers who make a practice of photographing nude girls and women for the lewd "art" magazines and for private collectors. But the model who values her reputation will give all such the go-by.

And there are still others who *call* themselves photographers, who advertise for girl models, but who are animated by less lofty motives. But here, again, the professional model knows how to sidestep and avoid such pitfalls, and if she is registered with the Bureau she is safeguarded against such traps.

Altogether, we models live a clean, healthy life—much cleaner and healthier, I venture to say, than the lives of many girls in other occupations that some people might consider "more respectable."

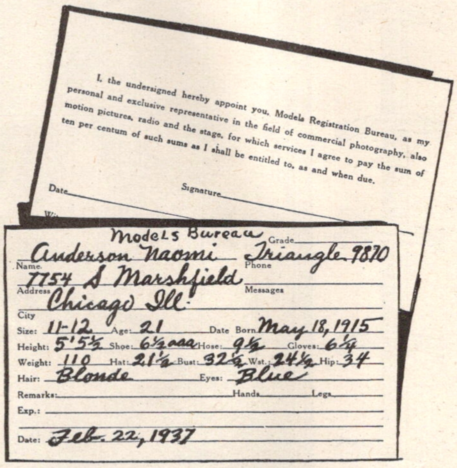
A model *must* live this way in order to hold her job. She must guard her figure and watch her diet, and she must take good care of her teeth and hair and skin. Facial blemishes that cosmetics might conceal from the ordinary eye will not deceive the merciless eye of the camera. The camera will search them out and reveal them for what they are.

She must exercise regularly and keep regular hours and she must get her eight hours sleep every night. She mustn't dissipate. And she must go easy on her cigarettes and drinking.

And the work isn't always easy, either. Usually two hours are required to make a satisfactory picture. In those two hours the model may change her posture dozens of times, and that isn't so fatiguing, but finally, when the photographer has just the pose he wants, she may hold it for what seems an interminable period while he gets his "effects."

Once I posed for an hour for Valentino Sarra, and all he wanted was my hand on a comptometer. After an hour's experimenting, I placed my hand the way he wanted it—and the "shot" was made.

It isn't often, however, that we depend on make-up for our effects, yet a few photographers believe in it, among them James Hargis Connolly. Connolly, famous photographer of beautiful women, personally makes up the lips and eyes of his models, and he generally takes two hours or more to do it. He is very particular. Rosenow is another photographer who uses make-up in his photography.



I, the undersigned hereby appoint you, Models Registration Bureau, as my personal and exclusive representative in the field of commercial photography, also motion pictures, radio and the stage, for which services I agree to pay the sum of ten per centum of such sums as I shall be entitled to, as and when due.

Date

Signature

Models Bureau

Grade

Name: Anderson Naomi

Phone: Triangle 9870

Address: 7754 S Marshfield

Messages

City: Chicago Ill.

Size: 11-12 Age: 21 Date Born: May 18, 1915

Height: 5'5½ Shoe: 6½aaa Hose: 9½ Gloves: 6¼

Weight: 110 Hat: 21½ Bust: 32½ Wst.: 24½ Hip: 34

Hair: Blonde Eyes: Blue

Remarks: Hands Legs

Exp.:

Date: Feb. 22, 1937

Miss Anderson's listing as it appears in the card-file record at the Model's Registration Bureau.

Other photographers have other methods, and some have peculiar quirks and notions, but the first thing a model must learn is not to "talk back" to the man at the camera. He's the boss, and, whatever her private conviction may be, she should remember that he's supposed to know his business and what the advertiser wants.

Before a model poses, she is told by the photographer the sort of picture he expects to make, and what the picture is expected to advertise and sell, and then she is told to get herself in a "mood" that will put the advertised product over.

And when I think of the things I've advertised! Soaps, perfumes, silk stockings, kitchen utensils, toothpaste, furs, plumbing, cosmetics, lipsticks, hats—almost everything known to womankind.

And the various roles I've enacted! I've been everything from a naive schoolgirl to a sophisticated woman of the world. I've been a fashionable young wife and a factory girl, a doctor's patient and a buoyant globe-trotter, a society woman in an aristocratic limousine and the ragged heroine of a detective story.

I have particularly done a lot of work at hairdressers' conventions. My hairline is considered very good and my hair lends itself to unusual hair styles. Photographers prefer light golden blond hair like mine because it photographs better.

After the photographer has described to his model the sort of person she is to portray, she is costumed or dressed for the part, and then given sufficient time to "get herself into character"—that is, the "feel" of the role she is to enact before the camera.

For my part, I've always enjoyed "character" parts best. Of all the hundreds of pictures I've posed for, I think the one that gave me the greatest "bang"—certainly the one that I still remember most vividly—was a photograph taken of a young man and myself on a make-believe whoopee party. We were both supposed to be hilariously drunk, and, though neither of us had tasted a drop, we got into the spirit of the thing and gave a convincing imitation of being intoxicated. The picture ran in the newspaper roto sections and attracted considerable comment.

In addition to the photographers I've mentioned, I've posed at various times for Stevens, Al Lighthall and Dell Long of Kaufman and Fabry, Miller of Photography, Inc., Ed Johnson of the Chicago Tribune, all of them experts and all tireless and most exacting in their eagerness to get the "perfect pose." Wesley Bowman, photographer for Lady Esther and Maurice Seymour, a theatrical photographer, are two others before whom I have done considerable posing.

Every once in a while we receive calls from men whose interest is not entirely professional. The Models' Bureau occasionally gets calls for "party girls," but such calls are invariably ignored. Once I did some professional work at a convention and the same men called me two weeks later for another job. I went, thinking it was strictly a business call, but found that another model and I were attending a strictly stag party. We were asked to dress in bathing suits and put on a two-minute boxing bout. We felt a bit silly about it, but did the work and each of us earned $10.00.

Most of my experiences are very pleasant and the men I meet both at conventions and studios, are usually very considerate. Not so long ago, however, I had been doing work for the photographer of one of the national magazines. He called me up one night and asked me to report to his office at five o'clock and told me particularly not to make any dates for the evening.

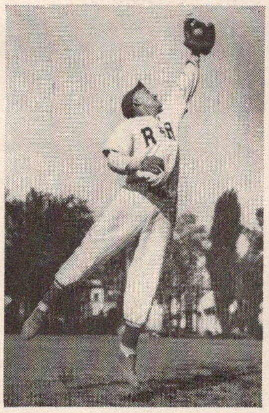
I went to his office expecting to put in several hours' work. At his office, however, he asked me to drive over with him to his studio where he intended to take the shots. I did so, but upon arrival he asked me to undress for nude posing. I explained that I was unwilling to pose in the nude, but that I would be willing to pose in underclothes. I did not care for the way he handled himself and decided to leave the studio. The situation was getting rather awkward and I remarked, with sly seriousness, that it would be quite a front page story were I to jump out of his studio win-

(*Concluded on page* 65)

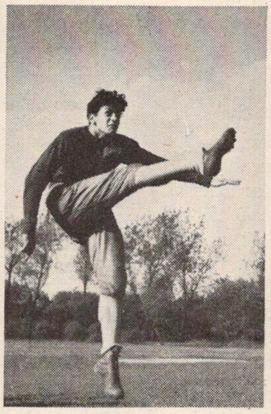
Fast Action with a Miniature

by STAN WITWER

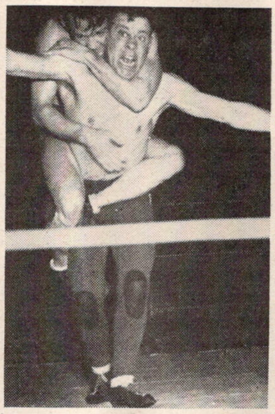
The Sports Photographer for the Dayton Journal offers valuable suggestions on shooting sport pictures.



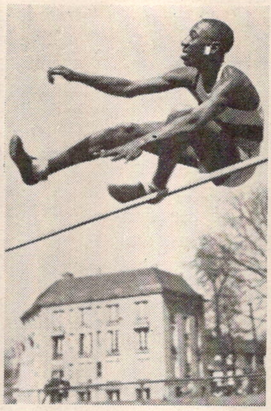
F 3.5 at 1/500.



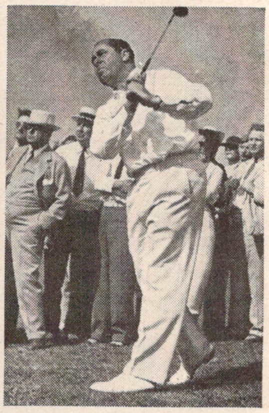
F 5.6 at 1/300.



F 8 at 1/100 plus one flash bulb.



F 3.5 at 1/500.



F 5.6 at 1/300.

NEWSPAPER photographers with their "Big Berthas," telephoto lenses and what not, have frightened a lot of ambitious amateurs away from taking sports pictures. The vastness of this professional equipment awes the average small camera wielder who feels he had best stick to stills and scenes where he knows his equipment will get results.

Yet, contrary to what he may feel, the fellow with a small camera and a knowledge of some tricks of the trade, can step out any afternoon and bag himself sports shots that will make the professionals sit up and take notice. I know, because I have done it.

As a matter of fact, the small job has a great many advantages over the general run of press cameras when it comes to sport action. In my work I consistently use a camera with f3.5 lens, top speed of 1/500 and a negative area of 2¼ by 2¼ inches.

Because of its short focal length, I get more depth of focus with the lens wide open than the speed graphic operator can expect with his stopped down to f8. On the sports field, where your subjects move faster than you can focus, this matter of depth is vitally important.

Another advantage is that the small cameras use inexpensive roll film yet, with the proper handling, produce negatives so contrasty that fine enlargements are easily obtained. And, whereas the professional generally is content to shoot two or three plates of any certain object, you can snap half a dozen "angle" shots of the same thing and then choose your best one.

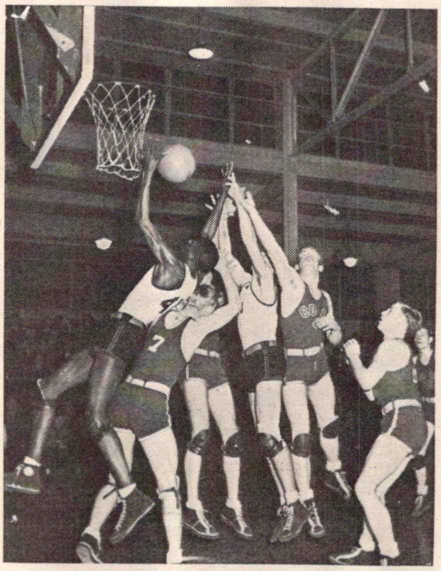
There are a lot of "do's" and "don't's" connected with this sort of work and some mention of them may be timely here.

Never try to photograph really fast action. Leave that to the fellow with 1/1000 speeds and expensive lenses. Remember, in every sporting event there are times when the play simply bubbles over with tenseness and "action" yet the athletes actually are hardly moving.

Those moments when the speed of the play slows down are when your pictures should be snapped. It would be just about impossible to stop the action of a golfer in the middle of his driving swing. But when he is through, his club lays over his shoulder for a tiny fraction of a second. The crowd's eyes are riveted on the ball speeding down the fairway. Everything is stopped dead. Then press your finger.

When the football player, starting an end run, suddenly pivots and dashes through a hole at tackle, he stops almost completely for a fleeting instant as he turns. That's your cue to get busy.

It is an advantage for the sports photographer to know something about the events he is covering. For instance, a well informed football man knows by the way a team lines up where the ball carrier is likely to go. Informed on baseball, he anticipates a steal from 2nd to 3rd and is ready with his camera focused on the base to be pilfered when the play is pulled off.



Stopped with one medium bulb at F 5.6, speed 1/100 with synchronized speedgun.

The third bit of advice for you who want to cover the big game with a camera that has only a miniature negative, is get "on top" of your subject. Don't try to sit in the stands and take baseball or football action. It can't be done. Get as close as rules and regulations will allow. The idea is that when your negative comes out the images on it will be as large as possible. Otherwise you risk the chance of robbing your print of much detail through necessary enlargements.

Make a habit of searching for "angles" before taking any picture, still or action. By this I mean you shouldn't take a picture while standing on your two feet with your camera at chest level. Get down on your knees and shoot up. Or get above the subject somehow and shoot down. Try not to take pictures on the level. Unique "angles" have made many a mediocre picture good. Likewise, many a swell picture loses its "stuff" because it wasn't taken from a crazy angle.

Last, but far from least, remember that faces in your pictures are important. So is background. The best football or baseball picture ever made is useless if you can't see the expressions of the players. As to background, you can't always be choosey. But when possible, take light subjects against dark backgrounds and dark subjects against light. Try not to shoot light faced subjects with light clothing against the sky. If your athlete is swarthy and dressed in dark clothes, that is a different story.

Having tucked all this knowledge in the back of our minds, let's actually get down

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Note that on all the pictures on this page the shutter was clicked at the "top of theswing" when motion was momentarily stopped.—Ed.

to work. The first sport I attempted to photograph with a small camera was track. That's good enough for any beginner.

Track meets offer a great variety of thrilling pictures. The sprints, pole vault, high jump and hurdles races are excellent subjects. The beginner should not run the risk of discouraging himself by shooting under heavy clouds or in the rain. Therefore, assuming the weather is clear and bright, set your stop at f3.5 or f4.5 and use a speed of 1/300 or 1/500, preferably the latter.

If you are interested in the sprints, take a position beside the track either in front of the starting line or at the finish. In this way, the runners move toward you from an angle. Never try to catch a runner going past you at right angles. The best pictures here are those of the runners lunging out of their pits or crossing the finish line with arms spread out and usually with excellent facial expressions of determination and grit.

For the high jump, get down and shoot up. It is comparatively easy to stop a jumper as he floats over the bar. The same applies to the pole vault.

In the field events take your shot putter just after he has thrown the shot, or just before he starts his lunge forward. Incidentally, field pictures may be easily acquired with lens opening at stop f8 and speed of 1/100 or 1/150.

Golf is another sport which offers good subject matter.

Assuming that the weather is bright, open your lens to about f5.6 and shoot at 1/300. At this speed take pictures of golfers driving off the tee. Wait until the drive is finished and catch the pose while the shotmaker pauses an instant and watches his ball go sailing down the fairway. Squat down and shoot up for this.

When the golfer shoots his ball into a sand trap, get above him if possible and snap your picture at the instant his club head hits the sand. If you are quick enough you will get a swell expression on his face, a shower of sand and the ball in the air. When he gets on the putting green take your picture just after his club has hit the ball. For this you may lessen your speed for the movement is slower.

The sandlot baseball game is the one for the amateur because he will not be permitted to get out on the diamond at league games and this is necessary if you are using the small camera. Baseball's highlights are many. Shoot rather fast, about 1/300 or 1/500 with stop opening to conform to the brightness of the light.

Trial shots might be of a batter swinging. If he hits the ball, shoot as he drops the bat and starts his dash toward first base. If he misses, press your trigger when he has completed his swing. That's when there is the least actual movement.

Get behind first base, always remembering to be in such a position that the runner moves toward you at an angle. Take pictures of the first baseman reaching for a thrown ball while the runner comes down the base path. Focus on the first baseman and at f5.6 or a smaller stop opening you will have plenty of depth of

(*Continued on page* 66)

Camera Fan Outraces Firemen

THE hope and prayer of most camera fans is to be standing with a camera all set for action when something unusual and exciting happens right in front of their lens. That, of course, is asking a little too much even for news photographers, whose business it is to try to get in the way of trouble.

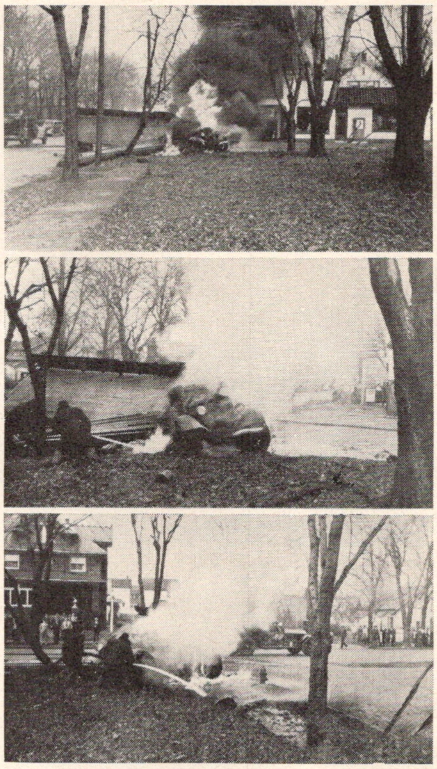
The next best thing is to get there fast when the siren blows, bells clang, or screeching brakes end in a sickening thud mixed with the tinkling of glass.

First man on the spot after a recent motor truck accident and fire in Canton, Ohio, was A. K. Olson of 3201 Tuscarawas Street, W., and his photographs of the progress of the blaze attest to his quick thinking and acting.

One Sunday afternoon, a huge trailer motor truck, in attempting to avoid collision with another car, swerved so fast that a wheel came loose and sent the truck hurtling into a corner sign post about 100 yards from Olson's home. The driver jumped to safety as the truck burst into flames. At the same instant, Olson jumped for his camera and burst out of the door. So quickly did he get to the scene and get his first picture of the blaze that although the fire department was located only a block away, and traffic was rather heavy at this point, he and his camera lens were the only spectators at the moment of his first exposure.

Successive pictures taken a few moments apart as the fire progressed and was finally subdued, gave Mr. Olson a complete picture story that would do credit to any nervy professional news photographer who forgets danger of explosion or damage to himself in his eagerness to get something "hot."

As a matter of fact, Mr. Olson's photos were the only ones taken at the scene. The photos were taken with an ordinary Eastman Kodak Junior 6-16 having a Kodak Anastigmat f6.3 lens, and with a shutter speed of up to only 1/100 of a second. The original negative is 2½x4¼—snapshot size.



Olson's camera records story of accident before firemen arrive. In top picture notice absence of onlookers. By the third exposure (bottom) crowd has already gathered.

For these shots, Olson used Kodak Super Sensitive Panchromatic 6-16 Film. A frame view finder was used, and the exposures were at 1/25 of a second with the aperture set at f11.

Light in Smoky Rooms

SMOKE consists of exceedingly fine solid particles suspended in the air. Light striking the surfaces of these closely spaced dust moats causes diffusion or spreading of the beam over a greater area and in this way, the diffused light may cause obscuration or distortion of an object when there is visible smoke in a room.

Smoke has been the cause of much trouble with amateur flood-light or flashlight shots, producing a haze or apparent fogging of the scene. The more brilliant the light and the greater the percentage of ultra violet in the light, the greater will be the fogging effect of smoke or suspended dust.

About That Exposure

OF THE two errors, over-exposure is preferable to under-exposure because an over-exposure can be reduced while a bad under-exposure can seldom be remedied. We can't create an image if it isn't there in the beginning.

Salon for Women

WOMEN have at last come into their own in photography with the announcement of the First National Salon for Women, sponsored by the Miniature Camera Club of Philadelphia. An entry fee of $1.00 is charged, for a maximum entry of six prints.

Only prints that are entirely the work of women residents of the United States and Canada are acceptable for entry. The exhibition can be seen from May 3 to May 10 at the Women's University Club of Philadelphia, 1701 Locust Street, Phila.

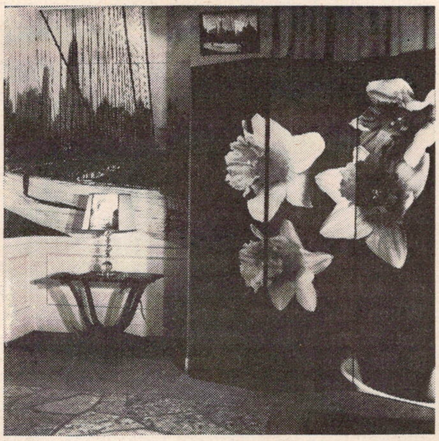
While women only have been allowed to compete in this novel salon, it is interesting to note that of the five judges a majority of three are men. This jury is composed of the following: Dr. D. J. Ruzicka, Margaret Gest, Ethel Herrick Warwick, Alfred A. DeLardi, F.R.P.S., William M. Rittase.

A complete Salon Calendar for the convenience of readers will be found on page 52.

Decorating with Photo-Murals

by HENRY D. COTTER

A photo-mural specialist discloses tricks of his art. Read how to decorate your own home with enlargements that are very easily made from your favorite negatives and which will add beauty and charm to your home.



A sample of the author's work. Note industrial view on wall. Lampshade and screen are also photo-murals.

DURING my 35 years as an enlargement specialist, the trend in the use of enlargements has changed materially.

A few years ago saw the beginning of their use in mural-photography. For example, last year I made a panel 178 feet wide for the United Fruit Line. This mural, which was hung in the sports shop of one of our leading department stores, began with a picture of New York's skyline, against which was shown one of the Fruit Line vessels leaving on a southern cruise.

The mural continued with various scenes photographed en route and concluded with the boat's arrival at Havana. This mural served a two-fold purpose. It gave a novel decorative effect to that section of the store in which it was hung. It also gave the store an opportunity to advertise its cruise clothes and the Fruit Line an opportunity to sell tickets to those people who were inspired by that photographic-mural to take the trip.

In one home the outstanding decoration of the library is a reproduction of an old map now in the New York Public Library. This photographic enlargement covers the entire wall on one side of the room.

The map is believed to be the one Captain Kidd used in planning his pirate expeditions and because of its romantic associations is keyed to the atmosphere of the room. For this particular room the map was enlarged in black and white and then colored in a soft blue grey to carry out the tone of the furnishings of the room.

In a photograph accompanying this article is shown the staircase in the Chicago home of Charles R. Walgreen (drug magnate). Walls are decorated with photo-murals depicting scenes from Mr. Walgreen's country estate. The views are actual photographs enlarged and skillfully applied like wallpaper. This work was completed under the direction of A. E. Clason, Mural Engineer for Kaufmann & Fabry of Chicago.

Color also has been introduced by means of these enlargements. Not only do we find the usual black and whites, sepias, and blueprints, but we have tinted scenes as well. Besides these one woman decorator is also using three tones of red in printing her photo-murals.

These enlargements are also being used to give the personal touch to screens and lamp shades. One woman decorator for whom I do the enlarging has gone into this most extensively. She is somewhat more than an amateur photographer herself and for the most part uses her own snapshots for her work. A favorite type of decoration with her is a spray of flowers. She photographs roses, pansies, daffodils, etc. These I enlarge to whatever size she requires.

The enlargements for 5 foot panel screens must be done in sections. Those for lampshades are done as a whole. For her lampshades she frequently uses a transparent paper which shows black and white in the daytime, but as she tints the prints on the under side, when the light is turned on they appear in their natural colors.

In one instance she made a special shade which carried the picture of a woman's two sons as its decoration. Another time she made a shade on which she placed the picture of a matron's prize-winning dachshund. This shade was so universally admired that her client permitted her to place it on exhibition in a smart decorator's window.

One day, the client's colored maid was exercising the dog and took him over to the store in the window of which the shade was exhibited. So impressed was she that she kept saying to the dog, "See yore picture. See yore picture," much to the entertainment of the crowd that collected about the window.

What I have done for her and for other decorators it is possible for anyone with a knowledge of photography to do for himself. There is no reason why lamp shades, screens and wall decorations should not be made at home from your favorite snapshots.

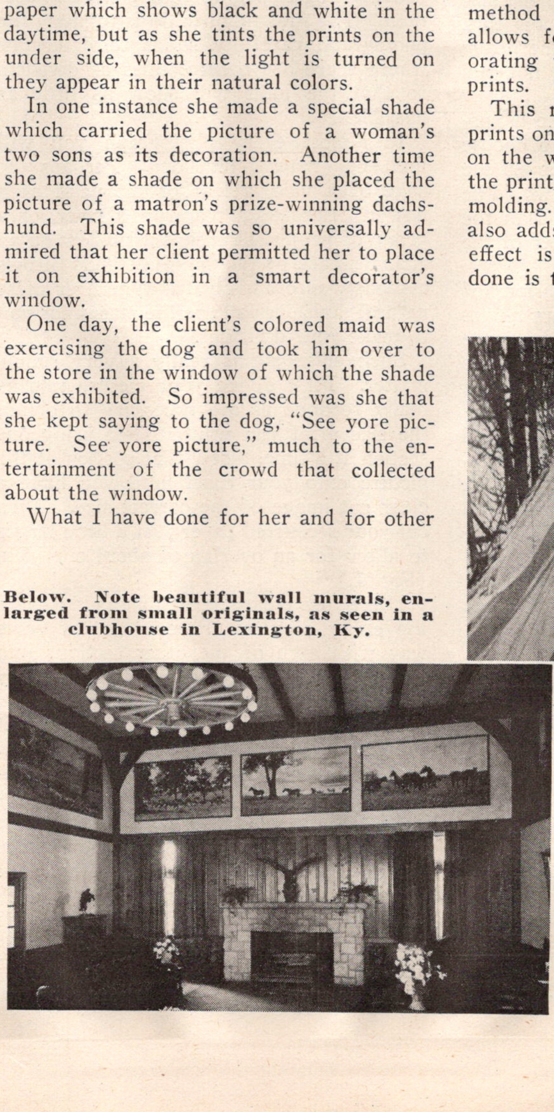
Children's pets can readily be silhouetted upon their playroom walls, scenes from summer vacations can add life to various rooms in the house. Adults can satisfy their desire for some particularly attractive place by using a reproduction of their favorite snap-shot either in a single panel, in a series of related panels, or in a continuous panorama like any scenic wallpaper.

Once the pictures are ready there is no difficulty about hanging them. They appear to best advantage on a plain tinted wall, but they can be used over a plain wallpaper. Any good paper-hanger can hang them. All he needs to know is how to match figures and the proper kind of sizing to use so that the pictures will lie flat and not curl.

Most of these enlargements are pasted directly on the wall, but there is another method that is becoming popular for it allows for changing the photos or redecorating the walls without damaging the prints.

This method consists of mounting the prints on stout muslin, which is then tacked on the wall. If a panel effect is desired, the prints are edged with a thin monometal molding. This holds the print firm and also adds to the decorative effect. If this effect is not desired, all that has to be done is to blur the heads of the tacks by

Below. Note beautiful wall murals, enlarged from small originals, as seen in a clubhouse in Lexington, Ky.



Above. The unusual staircase in the home of Charles R. Walgreen (drug magnate), as described in this article. The beautiful photo-murals on the wall depict scenes from his country estate and add a refreshing note to his town house.

tinting them in such a way that they merge into the landscape.

In making the enlargements for this work, I find it best to work from 8x10 negatives. By enlarging the original negatives to this size, I can clear up any spots in them and secure a smooth film, free from blemishes. For making my final prints, I have two easels, each a little more than 40 inches wide but of differing heights.

The ceiling of my dark room is the only limit to the height of the enlargement; but the width is governed by the width of the sensitive paper. Domestic paper does not come over 40 inches wide—foreign makes come up to 60 inches. For any space which requires a print more than 40 inches wide, I make the enlargement in sections. For my work I use an ordinary professional camera equipped with a Goerz lens. That's my preference, but any good lens will do. For light I use a carbon arc light, placed directly behind my camera in the dark room.

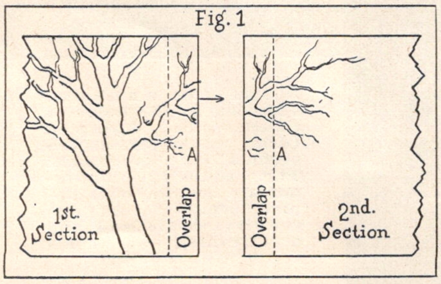
The amateur could do effective work by placing his camera directly in front of a window where the light is strong, and then painting the rest of the window pane with heavy black paint and protecting the sides of the camera from light seepage by hanging heavy black draperies around the sides of the camera. The only objection to this method is that the strength of the light varies with the weather and no night work is possible.

My easel runs on tracks so that I can readily adjust the distance between my camera and my easel according to the size of the enlargement I want. In doing this, I have to be careful to see that the heavy easel is moved evenly and does not run crooked.

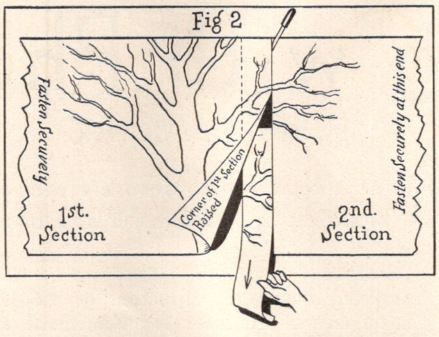
For those so situated as to make it possible, it would be much better to choose a solid wall for an easel and mount the camera and light upon tracks. It would be much easier to move the camera than the easel and there would be no danger of the easel's not being straight.

On my easel I mark the dimensions of the enlargement I want by sticking knives into the easel at the corners of the space to be used. With this method there is absolutely no limit to the size of the print I can make. When I have the dimensions marked, I place my film in the camera and adjust the focus of the lens until the sharpest possible image is thrown on the easel. Then capping my lens, I cut from the roll of sensitized paper a piece a little larger than the size required and tack it upon the easel.

Enlarging by artificial light of course gives me accurate control of my exposure, for the strength of the light does not vary. This is a most important factor in making sectional enlargements. On most of the photographs to be enlarged, there are some parts of the film which are less dense than others.



Illustrating how overlapping is accomplished to maintain continuity of subject.



Illustrating how the overlapped section is removed to obtain an even surface.

These are reflected on the easel as sharp, bright spots. If these were given the same length exposure as the rest of the negative, they would be burned right into the paper, so I shield them from the light for a part of the time by waving my hand over them while I am counting. Thus I can expose the denser parts of the negative longer than the thin parts. There is no set rule for such timing. Judgment and experience alone can solve that question.

Suppose you want to use some picture for a wall decoration more than 40 inches wide. You can easily make it as wide as you want by enlarging your picture in sections. The first thing to do is to study the photograph carefully so as to determine where there are natural lines of division, so that the joins will show as little as possible.

In almost every photograph you will find such natural divisions. Perhaps the edge of a vine, a leaf or the petal of a flower. Perhaps a roadway, a river, or a group of people. Perhaps a shadow on an animal's back or the way he stands throws a shadow across his body. Wherever these natural divisions fall are the places for you to make your divisions.

Such enlarging is really a very simple matter. First divide your picture into as many sections as are necessary to obtain the size print you want. Then using one section at a time, throw that portion of the picture onto your easel until you have a clear cut image of the correct size. Then cut your sensitized paper just a little larger to allow for an overlap of about one inch. (Fig. 1.)

Make your enlargement just as if it were the entire picture. Proceed in the same way with each of the other sections into which you have divided your picture. By working in this way you will have no trouble in making your enlargement fit whatever space you wish it to cover.

When you are working with these divided prints, you must be especially careful about matching your lines. That is the purpose of allowing the overlap of an inch. When you are ready to mount the print either on muslin or directly on the wall, I would advise your using the following method which I have found simple and effective.

Put your print into place, sliding the two pieces along until the lines match perfectly; then holding the join in place, paste the rest of the print firmly to the substance on which it is to be used.

When both parts of the print are securely fastened, take a sharp knife and cut on a straight line through the overlap of the sections. Then raise the edge of the outer portion of the print and slide the under piece away. (Fig. 2.) When you have done this, paste down the loose edge. This method will give you a perfect joint and one that is practically invisible.

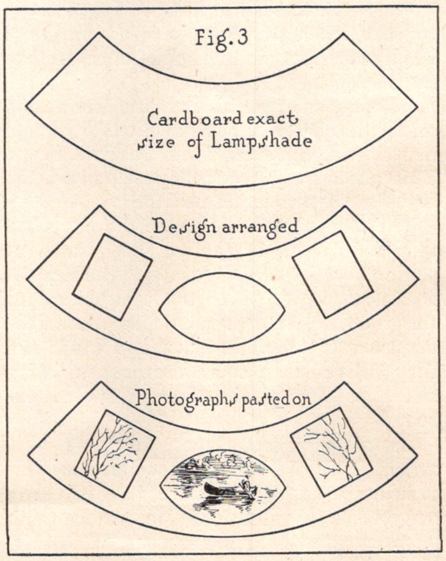
In making panels to cover screens proceed in just the same way. Again allow the inch overlap so as to make certain that the picture is perfectly matched. Right now there is a screen in my studio that was ruined because the person mounting the prints failed to match the lines of the petals of the flower.

This particular screen happens to be an enlargement of a spray of daffodils. When the screen is closed, it looks fine; but when it is open, it shows a variation in the line of the flower petal.

Another attractive form of home decoration to which photographic enlargements lend themselves is the making of lamp shades. These shades may be finished in black and white, grey tones, or in a sepia finish; or the photographs may be tinted so as to introduce a note of color. Of course you can use heavier paper and tint the photograph so that you see the colors all the time; but I think that the use of translite paper is more effective. This is the paper my client uses so as to secure a colored effect only when the light is lighted. [This is a translucent printing paper with an emulsion on both sides to insure sufficient density. The back side has a faster emulsion than the front surface so that both receive equivalent exposures. It is made both in contact and enlarging grades by Eastman Kodak Co., Rochester, N. Y.—Ed.]

In making these lampshades several steps are necessary. First take a piece of stiff white cardboard and draw on it an outline of the exact size of the finished shade. (Fig. 3, top.) Then mark off the exact

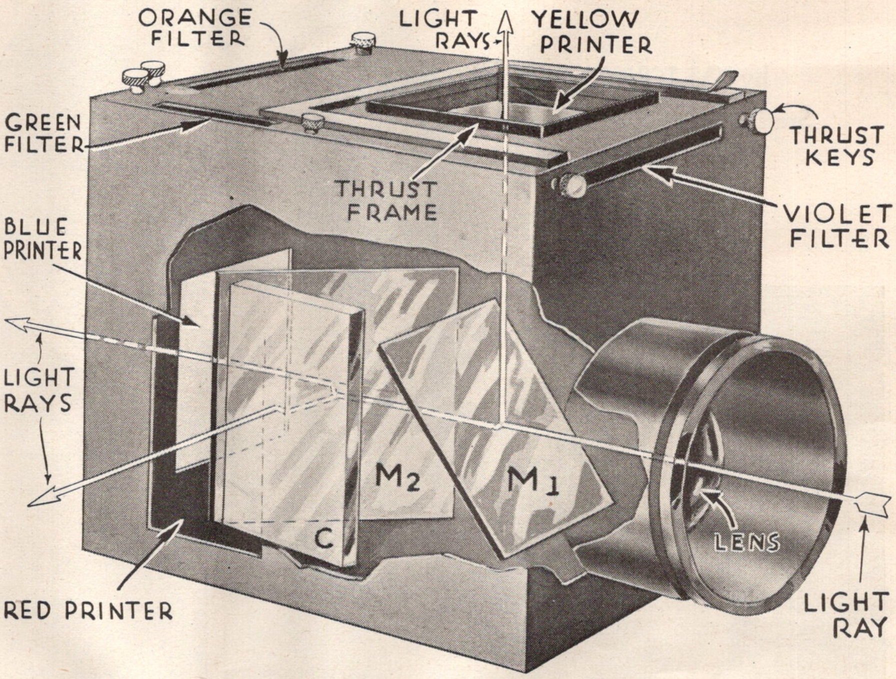
(Concluded on page 68)



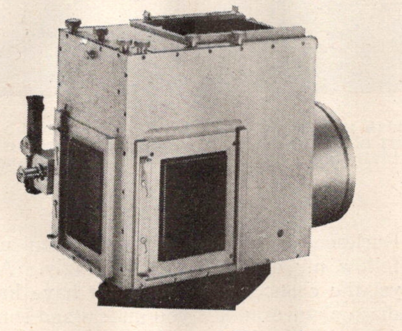
Illustrating the three stages in designing lamp murals.

Shooting Our Cover in Color

A detailed description of the new one-shot color camera used in making the direct color picture featured on the front cover of this issue. There are only a few of these very expensive and elaborate cameras in use and their novelty will appeal to our mechanically inclined readers.



Above. A diagrammatic sketch of the camera used in shooting our front cover. Note how the light from the subject passes through the lens and is broken down into its basic colors.



Above. Another view of Young's camera. Note the position of the red, blue and yellow printers.

THE direct-color photograph shown on our cover was taken especially for POPULAR PHOTOGRAPHY by Stanley Young of Chicago, with his new "one-shot" color camera.

The scene of the picture was the bathroom of a palatial apartment located on the Gold Coast of Chicago. The bathroom was carefully selected because it was colorful and, yet, so arranged that the camera and lights could be suitably placed.

Stanley Young is a young man, 31 years of age, and has been working on color photography for about eight years. He invented, designed, and built, his own camera. He has built several of them which are in popular use. The camera sells for $1200.00 for the 3¼x4¼ size.

In taking this picture Mr. Young used Carl Zeiss Tessar f 4.5 lens; 8¼-inch focal length. The plates used were Ilford hypersensitive panchromatic. Four synchronized photoflash bulbs were used for lighting.

Harry Bulson, professional photographer, acted as assistant to Mr. Young, and a member of the staff of POPULAR PHOTOGRAPHY was there on a confidential assignment to get some candid shots of the procedure. It required about 3 to 4 hours to take 6 shots.

The model was not at all ill at ease by the presence of the men. The mistress of the home, however, did look somewhat askance at a girl and three men walking into the bathroom, but, fortunately the girl was a professional model, which made everything quite proper.

The chief advantage of a one-shot camera is that it enables a photographer to catch action. In this particular shot fast action was necessary, since certain negatives were made with the shower running. Even when the shower was not running, as was the case in the cover picture, the drops of water were running down the model's figure very fast and had to be stopped. The camera was stopped down to f11 and exposed by synchronized photoflash at 1/75 of a second.

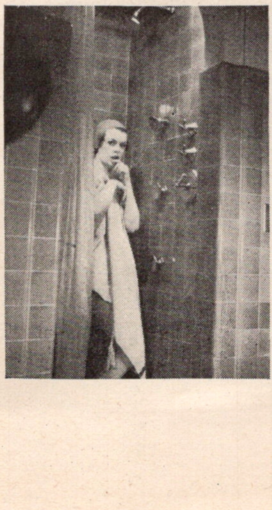
The one-shot camera permits sufficiently rapid exposures that fairly high speed work can be done by artificial light and daylight. It is widely used in pictures where live models are featured.

Referring to the sketch, rays of light reflected from the object pass through the lens and strike mirror M1. This mirror allows light to be reflected and transmitted at the same time. It is coated with a very

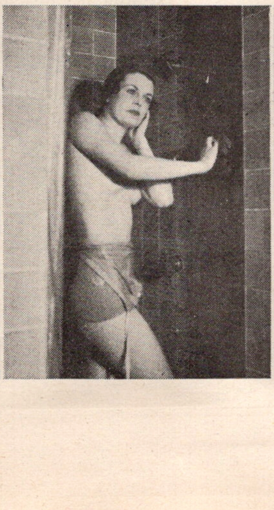
(*Continued on page 62*)

As the color photograph was taken our staff photographer, equipped with a Rolleiflex, snapped these interesting candid shots of the model. Stop f 3.8, exposure 1/25, film, Agfa Superpan.

Miss Powell, a bit abashed at her audience.



Getting used to the idea.



Bulson instructs model on holding towel.

Young does some more instructing.

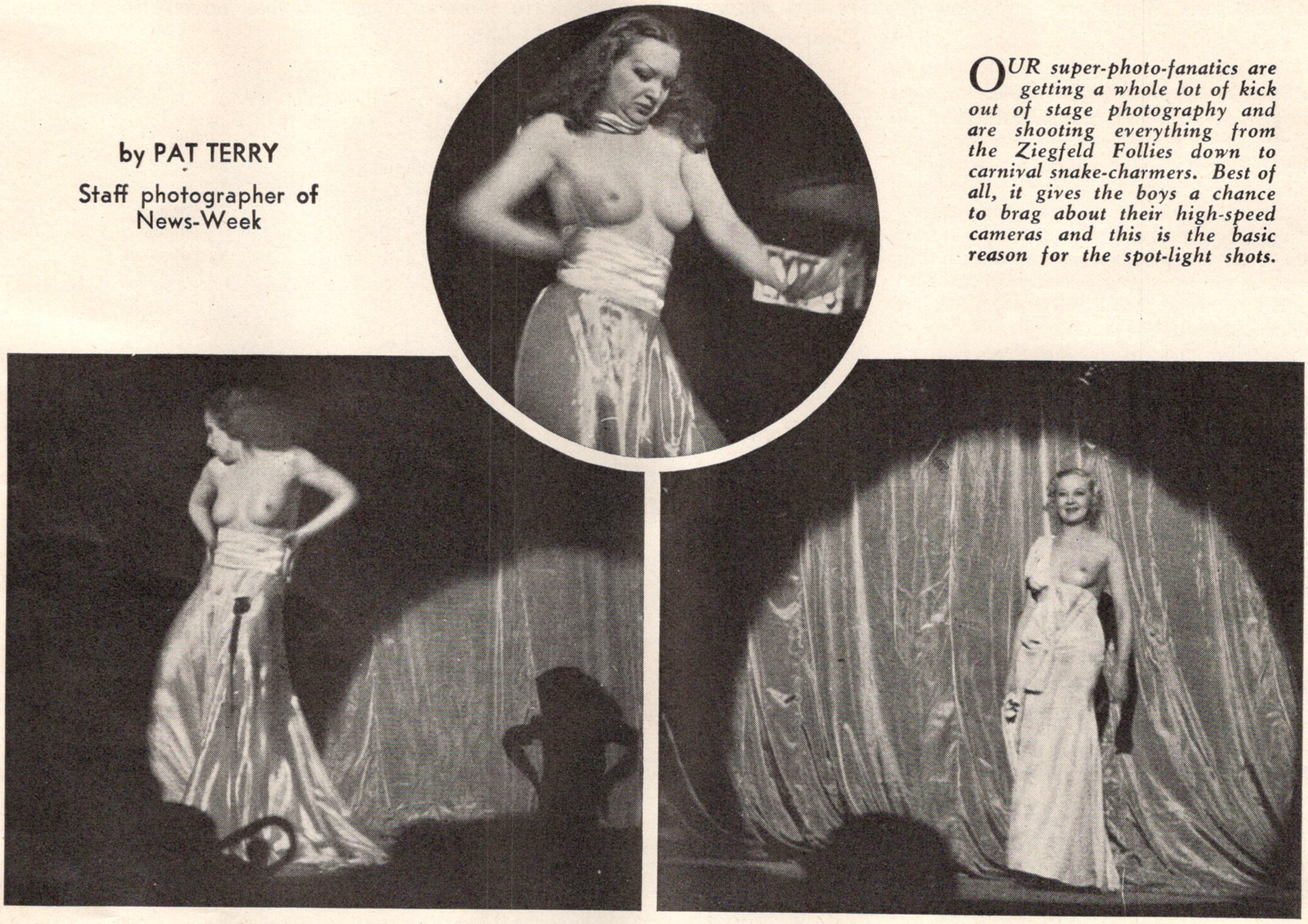
Young (right) and assistant ready to shoot.

Shooting the Burlesque From

by PAT TERRY

Staff photographer of
News-Week

OUR super-photo-fanatics are getting a whole lot of kick out of stage photography and are shooting everything from the Ziegfeld Follies down to carnival snake-charmers. Best of all, it gives the boys a chance to brag about their high-speed cameras and this is the basic reason for the spot-light shots.



IN CIRCLE. A good sharp close-up taken with a Contax on Super-X film. The theatre spot-light provided the illumination. **LEFT.** Caught while still moving rapidly but clean and sharp except at extreme lower left. **RIGHT.** A good time to take the shot, when the dancer is momentarily at a standstill, awaiting applause. Distance 25 feet, lens at f2.0.

NOBODY can become an outstanding photographer by mastering camera technique alone.

The quality that makes one man's work stand out sharper than another's, is his technique—plus his background. You can't put a fraction more into a picture than you can pull out of yourself. This is peculiarly true of theatrical photography where quick action and poor lighting handicap the average amateur.

Photography, *per se,* has little to do with giving an individual the ability to shoot hair-sharp pictures, which are the ultimate of camera work. Anybody can learn to operate a camera and to develop pictures. All you need to do is to "bone up" on it as you would on mathematics.

You can learn composition, despite what modern artists say. You can also familiarize yourself with the problems of focus, exposure, lighting, printing and so on. But you can't learn living. You can't learn to have a hunger for facts and a knowledge of and a sympathy for people unless you have knocked around.

I shall tell you exactly how I shot the accompanying photographs of the Minsky Burlesque strip-tease dancer. You may follow my directions painstakingly. And yet the chances are you won't have hair-sharp pictures unless you understand something of the dance routine, something of the theatre, something of the heart of the artist who is sweating to entertain a critical and sophisticated public.

Here is how I went about it:

These pictures were taken at a distance of twenty-five feet from the stage. I used a Contax Camera, list price, $399.00. The film was Eastman Super-X. The timing was 1/60 to 1/100 of a second, according to the dance routine and the lighting.

The average photographer would have had difficulty in stopping the motion, unless he had been a dancer, and had known exactly when the performer was going to stop in her routine. Unless he knew that dancing technique, he wouldn't have caught his picture. For by the time he was ready to shoot, the artist would have started into action again.

The reason I was able to get these strip-tease photographs hair-sharp was because I have been a tap-dancer myself. No, I never have done a strip-tease myself but a dancer knows when "breaks" in a routine are coming. I knew when the girl was going to stop dancing and tear off another piece of clothing. I got ready for her—and so the pictures!

Many years ago, my father and mother formed the team of Terry and Lambert, vaudeville artists, producers, tent-show performers and magicians. I travelled with them from childhood, going three times around the world and twenty-eight times across the Atlantic. I never attended school for one day. My mother taught me.

But my education was well-rounded for it included meeting everybody from Field Marshals to bus boys. Also I acted every sort of role on the stage, filling in in any capacity where I was needed.

All the time we were trouping I was interested in photography. And magic. The magic is important for it made me deft with my hands and gave me the ability later to misdirect attention from my camera by doing some sleight-of-hand trick.

My first camera was given to me by my mother in 1912. It was an Ensignette and had been bought for me at Harrington's, Limited, Sydney, Australia, where we were

the Center of Baldheaded Row

playing at the time. I was fourteen years old.

Houdini was a great friend of my parents. And whenever we were in London, he came to see us. We became so interested in magic—through him—that mother and I finally were booked for a magic act in vaudeville. Later we did a mind-reading stage stunt together, using the Morse Code for signals. But we never spoke a word. I cannot disclose our method here for I may use it again.

As I grew older I became interested in portrait photography. When playing in the "Misleading Lady" with Gladys Cooper and Ronald Colman, I took many pictures of them. My experience as a magician came in handy here, as I have said before for it was in that way that I could distract their attention from my camera and so catch them in natural attitudes.

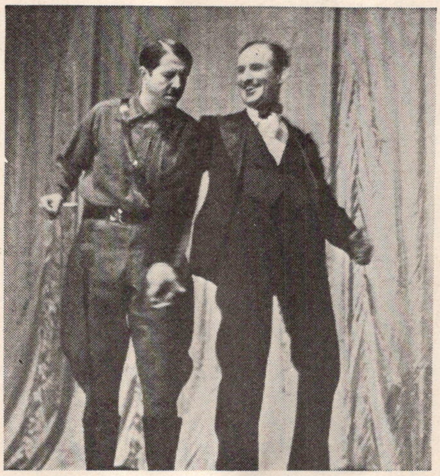
Also when I appeared in the first edition of "Potash and Perlmutter" in England, I photographed the cast many times over. This was done with stage lighting only and so I learned how to get "sharp" pictures without the aid of special floodlights.

It was shortly after I was in "Head Over Heels" with Mitzi Hajos in New York, when I got out of the war, that I got my first taste of real action photography. Whenever I could not get a stage engagement, I would go to sea as a Marconi operator.

On my way to Mexico aboard an oil tanker, a bad fire broke out in the hold. I was able to photograph it and, incidentally, as the fire spread, watch all my own luggage and photographic equipment burn up. It was this trip which decided me to become a professional photographer.

In all my work I use, as I said, a Contax camera, with a very fine lens—a Sonnar f1.5.

Equally useful for the purpose is the Leica with its fine f1.5 Xenar lens. However, I have seen many excellent stage pictures taken with cameras having f2.5 or even f3.5 lenses using Superpan film. However, greater care must be taken in making the exposure as it is hardly ever possible to use a shutter speed much in excess of 1/25-second with slow lenses and the likelihood of moving the camera is increased fourfold.



Two of the comedians "shot in the spot," another good shot with a high-speed lens. A surprising amount of sharp detail under unfavorable lighting conditions.

There are many cameras particularly adapted to this sort of work, not only because of their lens speed and definition when "wide-open," but because of their size. To avoid attracting attention when taking pictures, particularly when the management is not favorable to such proceedings, the camera should be as small and inconspicuous as possible. One of the smallest of these cameras is the f2. Foth-Derby in the moderate price division.

I should advise the amateur, in this connection, to buy the very best camera his pocket can afford. The Eastman Super-Bantam is an excellent machine. It costs one hundred ten dollars and is equipped with a built-in range finder and an f2 lens. It is fast enough to take strip-tease or any other theatrical pictures.

With the Super-Bantam, Super-X film should be used. Depending on the light and other factors, the timing will range from 1/250 of a second to ½ second. The lens should be used at its full aperture at all times.

For theatrical photography, I should suggest buying a seat on the center aisle about twenty-five to thirty feet from the stage. Ordinarily, when I take pictures, I circulate through the building. You might try that. But don't blame me if an usher quietly taps you on the shoulder and asks you to stay put.

Whenever taking pictures in the theatre, you should use a range finder type of camera. This range finder device, as you know, enables you to adjust your focus automatically. In a Leica you move a wheel which superimposes the two images. In a Bantam, it is a lever that you push. Don't ever use an exposure meter in the theatre. You have no time for it. You have to learn the *feel* of timing if you want to develop into a real candid theatre photographer.

The developing part is as important as your camera work. In finishing your pictures, try to procure a developer which will reduce to a minimum the coarse quality of the grain which is so often seen in miniature shots.

To accomplish this and to get a rich modulation of light and shade in pictures are the qualities to strive for in photography. I use my own developer which I cannot make public but any of the standard makes are good. Particularly Sease No. 3; M.P.G.; and Eastman's D-76.

The printing of your photographs is extremely important. Good printing can bring something out of a bad negative. And, conversely, bad printing can destroy the prime quality in a good negative.

In summing up, there is no reason why any amateur cannot take good pictures in a theatre, burlesque house, or opera house. Good equipment is necessary, lots of patience, a thorough knowledge of your camera and your subject—and the good will of the theatre manager.

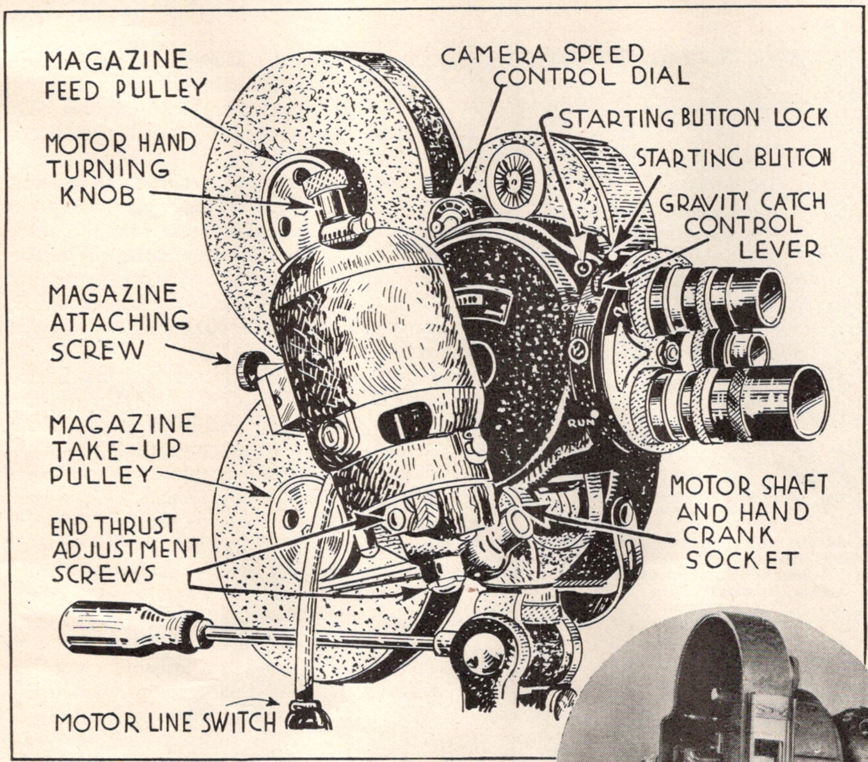
END

MINSKY'S BURLE

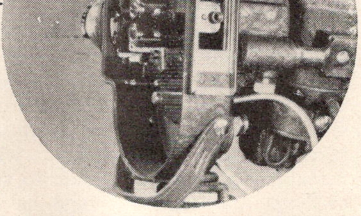
Yes! This is Minsky's burlesque show in New York where these stage pictures were taken. The only illumination came from the small electric lights over the entrance.

Here we have the "merry-merry" in full action, an almost unbelievably clean shot under the existing lighting conditions and motion. Note the depth of focus.

The "Tops" in Home Movie Cameras



Above. Illustrating the various gadgets on the elaborate Filmo 70-D camera.



Another view of the camera with interior exposed.

THE most costly and also the most elaborate of the personal (home) movie cameras is the Bell & Howell Filmo 70-D Special—a camera that in completeness closely rivals the elaborate professional cameras and equipment of Hollywood. Prices range from $228 to over $1000.

Equipped with an electric motor, an external magazine for 200 or 400 ft. reels, and with a multiplicity of speeds, lenses, adjustments and conveniences, the 70-D Special will take telephoto shots, double exposure shots, slow motion shots, will speed up lagging action, and will serve for almost any type of movie photography that even the most advanced amateur may desire.

The electric motor is a decided convenience for the personal camera, for it provides a constant and uniform speed with no periodic stops for winding at inconvenient moments. Motors for 110 volts are available for use on home lighting circuits.

A 12-volt motor is optional equipment for use on planes and Pullmans. This 12-volt motor can also be used by explorers and others where regular current is not available by carrying two 6-volt "Hot Shot" batteries; 5,000 feet of film or more can thus be run without winding worry. The 110-volt motor can likewise be run by three 45-volt "B" batteries. An additional synchronous motor is also available where sound recording is to be done.

Filmo 70-D Special has a turret head accommodating three lenses which may be changed instantly, giving a quick choice of normal, speed, wide angle or telephoto lenses. An equally versatile view finder may be as quickly set to match any of the lenses being used.

The choice of lenses is large, ranging from the 1-inch f1.5 to the 6-inch f4.5, and all are the very fast Taylor-Hobson lenses, noted for their sharp definition.

The view finder is of the spy glass type, giving a brilliant upright image, and is instantly adjustable to the field area of any of 6 different focal length lenses. A critical focuser for focusing the lens directly on the subject without removing it from the camera is also regular equipment.

Seven different film speeds give a complete range and any one of them may be brought quickly into use by the turn of a simple speed indicator. Speeds are 8, 12, 16 (normal speed), 24 (sound speed), 32, 48 and 64 (slow motion speed), frames per second.

To insure correct diaphragm setting for any camera speed, a relative exposure indicator automatically calculates the setting after the exposure for normal speed has been determined. The shutter of the 70-D Special has an open segment of 216°, giving an exposure of 1/27 second at normal speed, admitting a greatly increased amount of light. The shutter is of revolving disk type to give uniform exposure over the entire area.

The external magazine for 200 or 400 ft. of film is an added convenience that any photographer can appreciate, yet so equipping the 70-D Special does not interfere with the use of the camera by the internal loading of 100 ft. spools.

For advanced cinematography, this camera has a marked flexibility, yet Bell & Howell have designed this masterpiece of personal cameras for the utmost simplicity of operation. Actually, it is quite as simple to operate with excellent results as the average still camera.

Accessories for Exposure Meters

NOW that the exposure meter has become one of the accepted tools of the amateur, more particularly when the said amateur is dabbling around with the highly critical color films, a number of accessories for the meter have put in an appearance as might be expected.

If the meter is to guide the camera in its work, it must be used under exactly the same conditions as the camera, hence the recent addition of a meter lens hood to the list of auxiliaries for cutting off the stray light and reflections that so greatly interfere with getting correct readings. This special lens hood is a small hollow cone that is attached to the meter with spring snaps so that it is quickly attached to and removed from the meter.

Second in the list is a special large condenser lens, placed in front of the meter lens for increasing the intensity of the light on the photo-electric cell and thus effectively increasing its sensitivity in dull light. The diameter of the slip-on condenser lens is so chosen that it has a fixed multiplying effect and will give accurate readings in very dull light.

Army Air Corps Cameras

WE MUST give all due credit to the U. S. Army Air Corps, Photographic Division, for its intensive camera development campaign, and much of this credit goes to Capt. Stevens who has made great strides in the promotion of aerial photography.

First, we have the tremendous five, nine and ten lens cameras employed for mapping purposes, which take in several hundred square miles of territory at each shot. And then there is the extensive experimental work with infra-red ray photography, so important to air men in dirty weather. One short flight over enemy terrain is all that is sufficient for a full revelation of enemy activities and entrainment.

A Substitute for Ground Glass

IN CASE your ground-glass focusing screen is broken, an ordinary dry plate can be used as a substitute until a new ground glass can be obtained. The emulsion side of the plate should face forward on the lens side.

Catching Crooks with a Camera

by HARRY HIBSCHMAN
Member, Washington State Bar

A review of famous cases where photographs helped convict the criminal. The crime laboratories of the world have proved conclusively that the camera lens is more comprehensive than the eye.

The above photograph, taken by an itinerant street photographer, was the clue which solved the Fortescue murder case.

EARLY this year, in the heart of New York City, a murder was committed with over 600 present. To find the criminal seemed almost an impossibility, yet thanks to a photograph, the guilty ones were in custody within four days.

The place was a ballroom on the sixth floor of the Manhattan Opera House in the City of New York, the occasion a testimonial dinner. Just before the speaking began, some time after eleven o'clock on the night of January 19th, there was a commotion in one part of the vast hall, caused by the boisterous conduct of the party at one of the tables. When order was restored, one man was found to be seriously wounded and another dying, stabbed near the heart.

The police arrived within a few minutes after the excitement started and promptly covered all exits to prevent any of the diners from leaving the building before undergoing an examination. For hours the police questioned those present, arranged them as they were when the disorder began, and re-enacted the scene as described by the eye witnesses.

It was discovered that a picture had been taken of the gathering earlier in the evening and this picture was examined carefully. The picture revealed that at least six persons had left the hall before the police had blocked the doors, and of these they fixed on three as having probably been involved in the actual killing.

Two of them gave themselves up the following Tuesday, still wearing the dinner jackets in which they had fled from the Opera House and the third surrendered a day later.

One of our police inspectors, in commenting on the suggestion of an eminent criminologist that every respectable citizen be permitted to carry a gun, had remarked to me, jokingly, "It would be more sensible to have everybody carry a camera." And the Opera House murder, if murder it was, illustrates his point. That photograph [we tried to get this picture for our readers, but it has been impounded by the police—Ed.] established the identity of the three suspects and showed their absence. The very fact that they were missing cast suspicion upon them.

No wonder Inspector Donovan implied, though in jest, that it would be harder for the crooks if we all carried cameras than if we carried guns! Suppose that every time there is a bold daylight hold-up, or a defiant public gang killing, or a kidnapping, some one succeeded in snapping a picture of the perpetrators of the crime, or just their car, how greatly the odds now favoring the criminal would be reduced—how the chances of identifying him, of apprehending him, and of convicting him, would be increased! Camera vigilantes would do far more to stem the stream of crime in this country than gun vigilantes ever will.

That is evidently what an Oregon college professor recently thought, for, losing patience with the thief who kept stealing the milk bottles from his back porch, he rigged up an apparatus by which he made the thief take his own picture in the very act of reaching for a bottle. An Oklahoma banker had the same idea a few years ago, but unfortunately he was unable to give his camera proper protection, and the fellows who blew his safe took good care to destroy the camera. More striking, however, and more potent in results was a picture taken by an itinerant street photographer in London this last summer.

A woman keeping a rooming house had been murdered, and her two roomers (man and woman) had disappeared and were suspected. The roomers had only been at the house a few weeks, had kept entirely to themselves. No one was able to give anything like an accurate description of them, and the only clue found in their room was a pair of trousers with a cleaner's mark. Tracing the mark led the police to the home of a respectable citizen, whose wife had given the pants to a beggar, whom she was unable to describe except as a working man in appearance.

Without a single concrete thing to go on, the inspector in charge of the case recalled the street photographers whom he had noticed at various times taking short motion pictures of the passers-by; and he went to work and located four who had been operating in the neighborhood of the house in which the murder took place.

From these films he obtained thousands of feet of film that had never been claimed, and with that film he gave his own grim show. To it he invited everybody who might possibly have seen the wanted couple, and the film was run again and again. He was almost ready to admit defeat when suddenly a woman sprang up shouting, "That's them."

She was positive in her identification, and thousands of copies of one of the pictures were run off and scattered far and wide. And far away they were finally recognized, the man as an embezzler and a wife-deserter and the woman as a neighbor who had run away with him. Their speedy apprehension and conviction followed all because a street photographer

This photograph of 17-year-old Thelma Young was taken at the scene of her murder. Submitted as evidence in court, over the objections of the defendant, this photograph helped convict Robert Dreamer (inset) for her assault and murder. Dreamer was electrocuted early this year.

had hopefully turned his camera upon them as they passed down the street.

One of the first things a scientifically trained officer does today when he arrives at the scene of a crime is to photograph it in whole and in detail. Until that is done, the police allow nothing to be disturbed or removed. Their purpose in this is not merely to make a permanent record of the crime locale but in addition to let the camera catch and preserve facts and particulars invisible to, or unobserved by, the human eye. For they have learned by many experiences that a camera frequently reveals things that otherwise would go wholly undiscovered.

Some years ago, for example, the Paris police had occasion to examine a room in which they suspected a murder to have been committed but were wholly unable by their own senses to find any signs of blood on the floor, the walls or the furniture. A photograph of the room, however, clearly showed a large stain on the carpet that had been washed but could not be hidden from the eye of the camera. Many similar cases have been reported in all parts of the western world in recent years. Thus, in crime pictures, the camera reveals what the photographer normally endeavors to conceal.

In still another case the camera revealed finger marks on the throat of a victim, though they were invisible to the naked eye. And scratches on a floor showing that a body had been dragged over it and in what direction have been revealed in the same way.

To increase the usefulness of the camera in this connection, the scientific investigator has recourse, under proper conditions, to "invisible light" in taking his pictures. Thus, in a recent murder case in New Hampshire, the defendant was convicted entirely on circumstantial evidence, and an important link in the chain of that evidence consisted of photographs of the murderer's footprints in blood on the linoleum over which he had dragged his victim after beating him to death with a blackjack.

"Those were made," explained the witness by whom they had been taken, "with a light which produces an ultra-violet ray and increases the contrast in the blood and in the print itself, and then a special plate was used to bring out all the detail, some of it not visible to the naked eye, only with that light." The defendant's lawyer tried to have these photographs excluded as evidence, but the highest court of the state held that they had been properly admitted as the process employed merely served to furnish "abnormal aid to the normal human senses." [We tried to get these pictures also but the Attorney General informs us it would take a special order from the Supreme Court. Sorry, we'll try to catch the next murder.—Ed.]

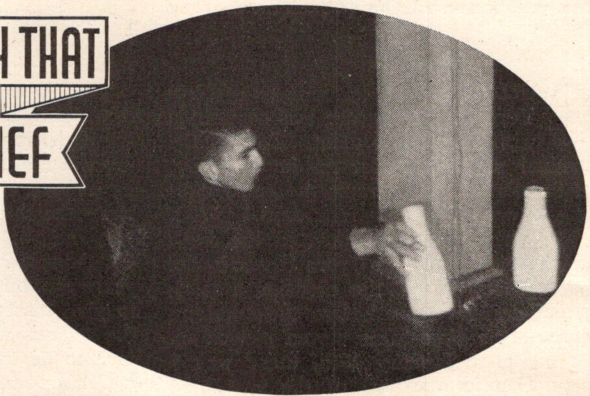
Another interesting case is that of 17-year-old Thelma Young who was attacked and murdered in Washington, Pa., on Dec. 29, 1927. Death was caused by concussion of the brain and strangulation. It wasn't until 8 years later that suspicion fastened on Robert Dreamer, who was arrested Jan. 21, 1936. At his trial, Dreamer's counsel objected to the admission of the photograph shown in this article. The judge overruled the objection and admitted the picture as evidence. Dreamer carried his objection to a higher court and was again overruled. The Supreme Court of Pennsylvania ruled that the photographs were admissible in evidence, sustained the conviction of Dreamer, who was finally electrocuted on Feb. 1, 1937.

One of the important uses of the camera at the scene of a crime is to record for later development finger-prints, foot-prints, tool marks, tire marks, and other minute details that might be difficult otherwise to preserve or to carry away. In a burglary case in San Francisco, for example, a few years ago a photograph of distinctive chisel marks on a window that had been forced open served to connect the defendant with the crime through a chisel

(*Continued on page* 61)

***No, this is not a murdered body.* The professor in criminal photography is merely showing the student detectives the correct method of photographing a body for evidence.**

A PHOTOGRAPH THAT TRAPPED A THIEF

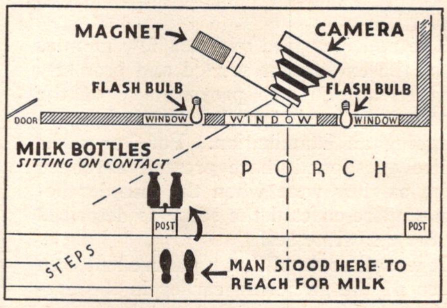


When the milk bottle was lifted, the flash caught the picture.

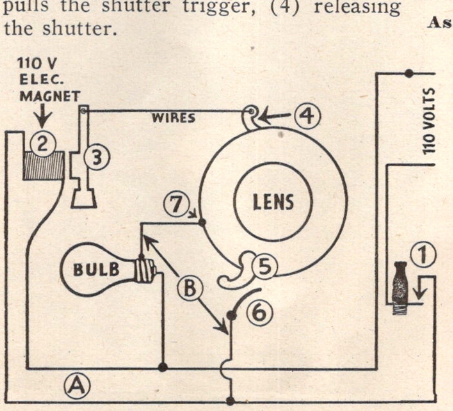
Charles F. Norris, 1623 S.W. 16th Ave., Portland, Oregon, trapped a thief with his camera and kindly provided POPULAR PHOTOGRAPHY with full details of the device.

AFTER a long period of paying milk bills, but receiving no milk, Mr. Norris devised this photographic milk-thief trap that solved his troubles. The device is simple but it works, as the accompanying photograph proves.

As the basis of the invention, we have the 5x7 Korona View Camera with its f4.5 Zeiss Tessar lens. To the camera was attached an electrical circuit containing a magnetic shutter trip and two flashlight bulbs placed in nearby windows. The contactor (1), or switch, was so arranged that lifting a milk bottle closed the circuit, energizes the magnet (2) which in turn attracts (3) and pulls the shutter trigger, (4) releasing the shutter.



Assembly and arrangement of the equipment.



Circuit diagrams and connections of photo trap.

The arm (5) now revolves to the right, contacting lever (6) and completes the circuit (B) between (6) and (7). This ignites the flash light bulbs, while the shutter is open, and with the circuit broken by the burned out bulbs, the shutter now closes. Ha-ha, the thief is registered.

In making the preliminary adjustments, the camera is first focused upon the spot where the milk is left by the milkman. The lens is stopped down to f8. and the shutter set at ½ second. And when the bottle is lifted, what a surprise awaits the moocher!

Simple Makeup for The Amateur

by JACK HAZLEHURST

The author, an expert makeup artist, reveals how you can make interesting character studies of your friends with the aid of low cost materials. Home portraiture and pictorials are among the most interesting of photographic hobbies and are very popular diversions.

ONE must first consider the problem of makeup from the point of view of straight portraiture. Makeup is needed particularly when photographing women where the need for smooth delicate complexion is necessary. Only in unusual cases should makeup be used on men, for it is likely to produce a sissy effect unless it is handled in an extremely expert manner.

The first thing that the maker of portraits must learn is how to balance lights, so that the face is well modeled (see Fig. 1).

It is at this point that the average amateur portrait maker may get into trouble, owing to the mottled character of the complexion.

The face is made up almost of a mosaic of colors caused by blood vessels lying just beneath the surface of the skin. These are blended by the eye into an even tone which makes up the complexion. To the camera, however, every single variation of color exists as a variation in monochrome tone and the complexion which blends to the eye remains a mosaic to the camera.

This is particularly true with old style orthochromatic film. Modern panchromatic film, which should always be used for portraiture, minimizes this effect but doesn't get away from it altogether. The difficulty, however, can be overcome by the amateur photographer in the same way that it is overcome in the motion picture industry, namely by the use of makeup.

There are many kinds of makeup materials, but the only kind with which the author is thoroughly familiar is the kind which he has used for a number of years, namely Max Factor Pancromatic makeup.

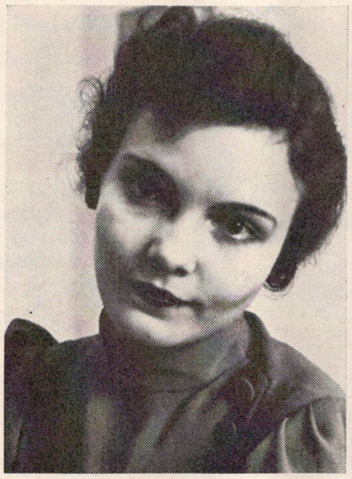


Fig. 1. Balanced lighting for good modeling.

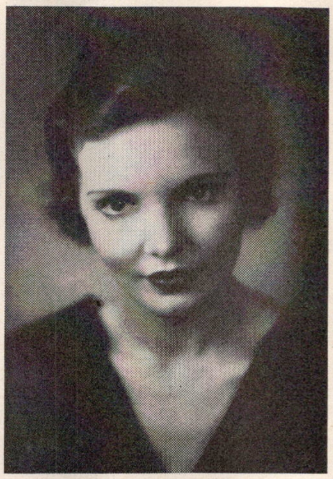


Fig. 2. Simple makeup improves portraits.

There are a very large number of paints manufactured by this company and any one purchasing a supply for photographic purposes is generally encouraged to lay in a little bit of everything. It will be found, however, that the following list of materials will supply all the makeup needs for normal portrait photography.

Panchro Grease Paint	No. 24
Panchro Lining Color	No. 22
Panchro Moist Rouge	No. 9
Panchro Face Powder	No. 25
Dermatograph Pencil	Brown
Powder Brush	

The total cost of this material is $2.60. While the author has never used Elizabeth Arden makeup he has examined their many preparations and if Max Factor makeup is not available the following list of Elizabeth Arden material will be found to be the equivalent.

All of the pictures on this page were posed by the same model.

Base Paint	No. 5
Lining Color	No. 2
Lip Rouge	No. 22
Face Powder	No. 6
Dermatograph Pencil	Brown
Cream Dissolver	
Powder Brush	

It will be noted that it is necessary to purchase the cream remover to take off the makeup after it has once been put on. The price of the above list is $6.00.

To apply this makeup, the face should first be thoroughly cleaned by washing it with soap and water, or by removing all street makeup with cold cream. If cold cream is used it should be thoroughly removed before applying the base makeup. Next, squeeze out about one-half an inch of the grease paint into the palm of one hand and with a finger of the other hand dab this paint all over the face until it appears to be freckled. *Grease paint must be used sparingly because too much will spoil the makeup.*

After this paint has been distributed in little dots all over the face, under the chin and around the neck, the remaining grease paint can be removed from the hands and then, with the finger tips moist with water, the grease paint is spread all over the face blending it smoothly, evenly, and thinly into the skin. It is necessary to keep dipping the finger tips into water in order to blend the grease paint into a smooth and thin application.

One must be particularly careful to avoid the temptation of putting on a heavy coat of makeup to cover blemishes that may appear on the skin. This makeup is not meant to remove scars or any topographical irregularities. It is merely to be used to even

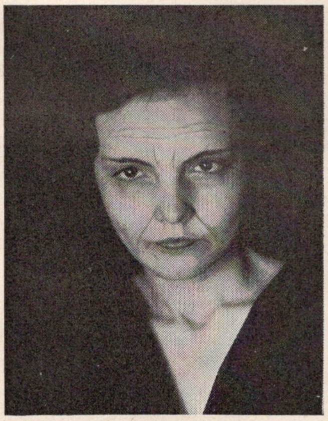


Fig. 3. Adding years with a few wrinkles.

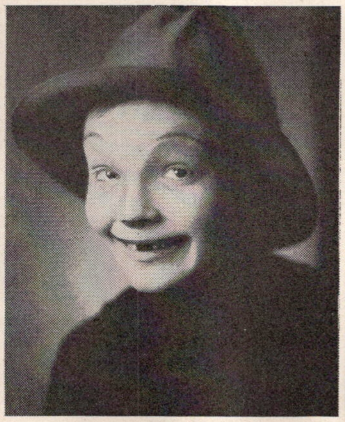


Fig. 4. New eyebrows and blocked-out teeth.

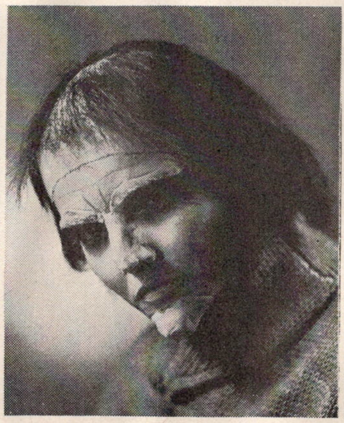


Fig. 5. A new nose and chin with nose putty.

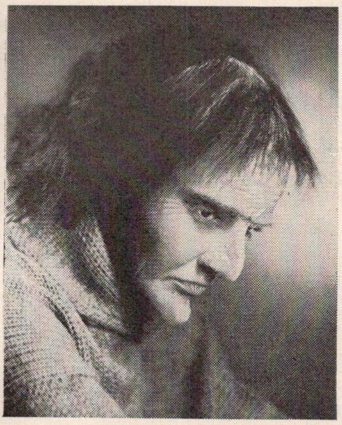


Fig. 6. A complete change with character makeup.

the skin tone and provide a base for the powder which is later applied. If not over a half an inch of paint is used this danger can easily be avoided.

Special attention must be paid to see that no places are skipped underneath the chin, along the edge of the jaw, or at the corners of the nostrils. This makeup should not be applied over the lips. It is unnecessary to cover the ears, and for most portraits only the front of the neck need receive any paint. It should be blended off about at the line of the collar bone.

After the face paint has been applied, the next step is to shade the eyelids with the lining color. To do this, a thin film of color is applied to the eyelids with the finger tips using a light outward motion, blending it carefully upward and outward toward the eyebrows and the outer edge of the lid. One should also be very careful not to overdo this eye shadowing.

If the eyes of the subject are rather deep set it is often unnecessary to use any lining color whatever. If, however, the eyes are clear out even with the brow it will be necessary to do a little shading to get the necessary shadow qualities around them in the finished picture. The color can be a little heavier on the eyelids than it is between the lids and the brow, and should blend off as it reaches the brow.

After this, the *edge* of the upper eyelid should be defined slightly with dermatographic pencil. If it is desired to make the eyes look larger, the line of the upper lid can be carried perhaps an eighth of an inch outward past the point where it ends. This, however, must not be overdone. The outer edge of the under lid may be outlined very very lightly, blending it off as it carries inward toward the nose. Too much lining of the under lid always gives a heavy theatrical and artificial appearance and should be carefully avoided.

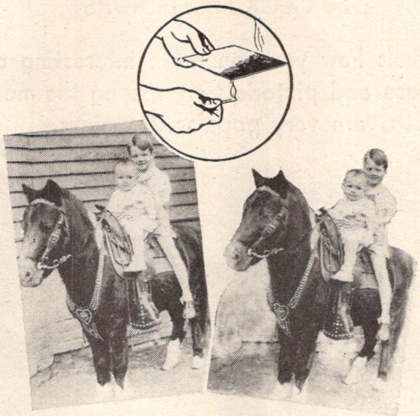
It is important that the application of these cosmetics be in this order. After this has been done, powder is applied. It is well to cover the hair with a towel or cap and also the clothing. The powder is then applied profusely over the entire face with a puff and should be patted until it is absorbed by the grease paint. Particular care must be taken to get the inside corners of the eyes powdered.

When all of the grease paint has been covered with powder, the surplus should be removed with the powder brush. Brush the entire makeup very lightly and then carefully remove every bit of the extra powder, leaving a soft, velvety complexion. As a result it will be found that although such discolorations as freckles may have shown through the original thin layer of grease paint, the powder will effectively cover them giving a soft, even tone of the skin which photographs beautifully.

Next, lip rouge should be applied to the lips. Most women are sufficiently adept at applying lip rouge that it is best for the photographer to allow them to do it in their own way. An even, fairly heavy application should be given following the contours that are usually followed in the ordinary street makeup. By allowing the sitter to put on her own lips the photographer

(*Concluded on page* 64)

Removing Unsightly Backgrounds



Before and after the smoking-out process.

OBJECTIONABLE backgrounds such as the weatherboarded side of the house shown in one of the accompanying illustrations may be easily removed from photographic negatives by the "smoking" process. The background is not eliminated from the negative but is rendered opaque so that it does not print through.

In the accompanying illustrations, we see "before-and-after" prints from 5x7 glass plate negatives, one print of which shows the background after it was smoked out. To do this, simply take the glass plate and hold it over a match or candle flame until the objectional background is covered with a dense layer of smoke.

Now, carefully remove the smoke from the glass on the sections that are to show in the print, such as faces, figures, etc., wiping it off with any suitable object. Follow the outlines carefully. Of course, this is done on the back of the plate, not the emulsion side.

This process can be used with film by laying the film on the glass of your printing frame and then smoking the glass as before, while looking through the film. By having the glass between the smoke and the film, the image is diffused. By using an extra thickness of glass, the diffusion is increased. When the prints have been made, the glass or plate can be cleaned and put away.

If you wish to make additional prints at a later date, bind another piece of glass to the plate, protecting the smoked surface.

Fancy worked-in backgrounds can be made by this method. Take your photograph in front of a smooth dark grey background. Then when the negative is dry give the back of the glass a thin even coat of the smoke just enough to make it print a few shades lighter. Then, with the end of a matchstick or very fine brush, work fancy designs in the smoke to suit your fancy. Be sure all the smoke is removed from the parts that you wish to print.

A little practice will be necessary to get this process down perfect but it will enable you to do wonders with your photos.

Flood-Flash Lamp

A NEW flood-flash lamp, which can be flashed again and again without burning out, is in the process of development in the Mazda Lamp Laboratories, according to announcement by the lamp division of Westinghouse Electric & Manufacturing Co. of Bloomfield, N. J.

While not available commercially yet, the flood-flash lamp, when perfected, may be used for general studio lighting while posing the subject and then may be flashed for the actual photograph, it is reported. The new light source is said to be similar in appearance and construction to other intensity mercury vapor lamps now on the market in that it consists of a bulb within a bulb. Under continuous operating conditions the lamp consumes about 100 watts, producing 3,000 lumens.

By operating with special equipment high momentary current discharges may be passed through it, resulting in a flash of peak briliancy of about 500,000 lumens with an average brilliancy of 300,000 lumens.

The Photographer Gets in the Picture

SNOWBOUND in a log cabin on a mountain near Woodstock, N. Y.—four people and a bottle of champagne. All wanted to get into the picture to record the event, but someone had to snap the picture. Here is the way it was done.

The photographer, E. C. Schnurmacher, is seated at the right. Note that his left hand is under the table. Look closely at the right foreground and you will see a white line under the table. This is a piece of string which runs from the photographer's hand to the pull chain of a floor lamp.

The photographer focused his camera on the group. He placed an ordinary photoflash bulb in the floor lamp, and ran the string under the table to his seat. Then he turned out all the lights and set the camera to "open" at f11. He took his seat in the darkness, picked up the cord and gave the order to pose. Then he pulled the cord, the flash bulb went off and the picture was recorded. He then made his way to the camera in the dark and closed the lens.

The accompanying illustration shows the result. Note the intentional highlighting on the forehead due to the mirror on the wall. Incidentally this is the same Schnurmacher whose article appears on page 13.

The photographer, at extreme right, is shown releasing the shutter with his left hand.

Common Errors in Home Movies

by E. A. REEVE
(Bell & Howell Company)

Eight simple rules suggested by the author to improve your technique and raise your results several notches closer to professional work. The author has had extended contact with amateurs and thoroughly understands their problems.

THE faults which mark the work of many, if not most, beginners in personal movie making are fortunately few in number and easy to overcome.

But they are serious faults—so serious that until are *are* overcome one's films are unsatisfactory to everyone. Improvement will come with experience. But experience is a dear teacher and it is in the hope of saving beginners much loss of film, time and respect for their ability and equipment that this article is written.

What are the errors most frequently made by beginners? First, and perhaps most serious, is failure to hold the camera steadily. In movie making it is the subject and not the camera which should move. If the camera is held unsteadily, the motion of the subject is obscured, on the projection screen, by the swaying and jiggling of the entire picture. It is as though you held up a snapshot for someone to see and jerked and wiggled it continuously. The picture simply couldn't be seen clearly, and your friend would soon stop trying to see it.

Watch some fixed object—a house, a tree, a fence—in each scene as your films are projected. That object should remain stationary on the screen. If it moves in relation to the edges of the picture, you have broken Rule No. 1—you have failed to hold the camera steadily.

What can you do about it? Nothing in regard to films already made. Plenty in your future filming. First, see that you are grasping the camera as the manufacturer suggests. If it is used at the eye level, as most movie cameras are, give it firm, three-point support. Let it rest against your forehead. Hold it with two hands, and keep your elbows close against your body. Place your feet apart to obtain a firm stance.

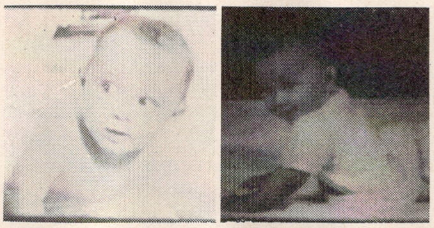
Practice, without operating the camera, by sighting through the finder at some stationary object. Soon you will find the grasp and the stance and the depth of breathing that will let you keep your target steadily centered in the finder for the ten or more seconds required to take a movie scene. Then do as well while actually taking movies, and when you see the film projected you'll be pleased at the improvement.

Rule 1. Use a tripod to avoid jiggly pictures.

Some people simply can't hold a camera absolutely steady. Some think they can, but can't. But there's a solution for these people, too. It is—use a tripod. In fact, it is safe to say that no matter how steadily you can hold a movie camera, the use of a tripod will make a definite improvement in your movies.

There are times, of course, when the motion picture camera should be moved while in operation—to record a broad expanse of landscape, to follow a moving subject such as a car, a boat, a group of people, or the family dog at play. But swinging the camera during operation should be the exception, and Common Error No. 2 is excessive use of this motion.

Swinging the camera in a horizontal plane is called panoraming, which is commonly abbreviated to panning or pamming. Swinging the camera vertically is called tilting. In all too many amateur films, almost every foot is exposed with one or the other or a combination of these two camera motions. The effect is monotonous and tiring, and the constant camera motion causes true subject motion to suffer in comparison, besides making it difficult fully to see the subject.



Over-exposure Under-exposure

Avoid these mistakes by using an exposure meter.

Take most of your scenes with an absolutely stationary camera. Avoid the inclination to play your lens over a group of people or the facade of a building as though the lens were a hose and your subject a lawn needing water. Step back until the viewfinder tells you that you can take in the desired area with a stationary camera. Save your panning and tilting for the occasions when they are necessary and appropriate.

Common Error No. 3 is the fast and jerky pan or tilt. If the motion is very fast, the pictures will be blurred. A less speedy but still too fast pan will give that annoying effect of vertical objects jumping sidewise across the screen. When it *is* desirable to pan or tilt, be sure that the motion is very slow and uniform. And any but a very slow, steady pan will be useless, because the eye can't enjoy the scene as it whizzes by.

Keep the subject centered when panning fast action.

A *series* of scenes from a fixed viewpoint will usually be more satisfactory than a scene taken by swinging the camera through an arc. But if you want to show the juxtaposition of various scenes, shoot the first with a stationary camera, then pan *slowly* to the next and film it with the camera held still, and so on.

Remember that the speed of panning will always seem greater on the screen than it appears through the camera viewfinder. When you think you are panning slowly enough, cut your speed in half and you'll get better results.

If your reason for panning is to follow a moving object—a child running, a car moving along a street, the action in an athletic event, then and only then should you disregard the rule of panning slowly. For in this case the problem is to keep the moving object constantly in the picture, and if the background becomes blurred in the process no one will criticize you.

Fourth in our list of common errors is inadequate length of scenes. When the camera is humming away, time seems to fly and many beginners stop shooting after a few seconds, thinking that they've used enough film on that particular camera run. But that scene will flash on and off the screen before the audience has had time to see it, and what was intended to be commendable regard for the cost of film turns out to be waste.

A good general rule is that no scene should appear on the screen for less than 10 seconds. Ten seconds is your minimum. It is enough for any scene in which the action or the interest is continuous, but not changing in nature, such as scenic shots and pictures of people doing nothing in particular. Of course, many scenes will require a much longer camera running time. Scenes involving a flow of action will necessarily be continued until the end of the desired action.

Counting while filming is the generally used way of avoiding too-short scenes. A little practice with your watch before you will make you accurate at counting off the seconds.

If your camera is used on a tripod and you are not peering through the viewfinder, you can regulate scene length by watching the footage dial.

At normal operating speed, 16 frames per second, a 16 mm. camera exposes a foot of film (40 frames) in 2½ seconds; four feet in the minimum scene length time—10 seconds.

At normal speed an 8 mm. camera exposes a foot of film (80 frames) in 5 seconds; never stop the 8 mm. camera until the footage dial has clicked off at least two feet. The film size has no effect, of course, on the minimum desirable scene length *as expressed in time.*

Error No. 5 is failure to take closeups. People—family and friends—appear in most personal movie films, yet all too often they are recognizable only with difficulty, if at all. Not because the pictures are not clear and bright but because one's face is small in a picture which takes in the full length of the figure and perhaps a lot of foreground and background, too.

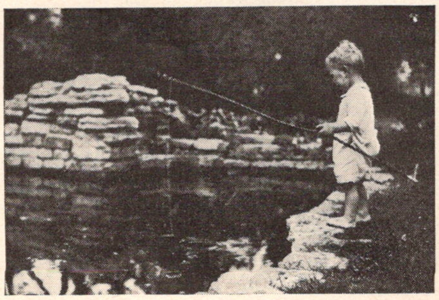
Get up close. Intersperse your long shots with scenes in which a single head fills the entire height of your picture area. Walk up until you just get the chin in at the bottom of the viewfinder without scalping the subject with the top of the viewfinder, and shoot. Then you'll have family record pictures which are really likenesses.

Your camera may have a universal focus (fixed focus) lens, and that will limit you somewhat in taking real close closeups. Consult the instruction book to see just how close you can work and still get sharp focus.

The stronger the light the smaller a lens setting you can use, and the smaller the lens setting the closer you can get without losing sharp focus. If yours is an 8 mm. camera with the usual 12½ mm. lens, you'll find that good sharp close-ups can be taken when the light is good enough so that you're using a lens setting of f 8 or f 11. But with a 16 mm. camera with the usual 1-inch lens, the taking of real close-ups really demands a focusing mount lens.

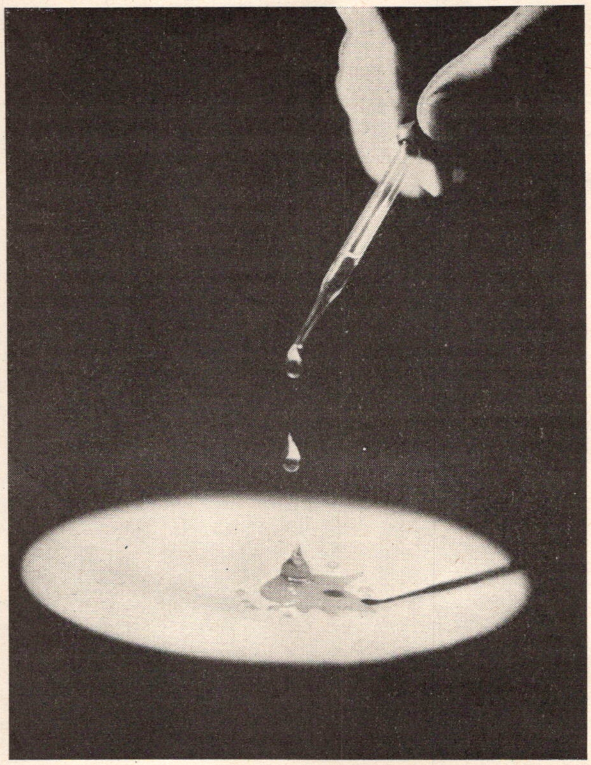
There are so many worthwhile things which, if you are equipped for taking close-ups, you can inject into your films, that a focusing mount lens is an excellent investment. Watch the professionally made

(*Continued on page* 74)



Take pictures while the subject is occupied.

Dramatizing a Drop of Water



A perfect waterdrop—without water.

THE accompanying photograph "Water," was taken for the Sayers & Scovill Company of Cincinnati, manufacturers of high-grade funeral cars and ambulances to be used in their advertising.

The photograph was made for its attention-value primarily, but it was also designed to enable the layman to visualize how a very small amount of water would render a piece of lumber unfit for the advertiser's rigid requirements.

The photograph was taken by filling an eye-dropper with glycerine from the bulb end after the nozzle had been blocked with a drop of molten glass. A stick of free glass, which is hard and contains no flaws, was taken to the laboratory of the University of Cincinnati. Under intense heat, the glass was allowed to melt and drop several feet to a cushion. In this manner, the glass formed and hardened into a natural drop. The distance of drop was regulated so as to produce the desired shape. The middle drop in the photographic set-up was suspended from a human hair, the same color as the props. Before being suspended, the hair was carefully buffed with the finest grade of emery paper obtainable in order to eliminate shine.

It was a simple matter, then, to attach the very tip of the hair to the tip of the glass drop by means of a tiny speck of glue, applied with the smaller end of a toothpick. The bottom drop was merely laid in a small pool of glycerine. The glycerine was used because the character of the liquid allows it to "stay put" without drying up too quickly.

From then on, it was a simple matter to pose a hand and shoot the picture in the conventional way, after properly organizing the lighting arrangement. It is interesting to note that the camera was stopped way down and the negative was given quite a long exposure. Softness in the picture was obtained by screening the lens.

The photograph was made by Z. Alexander, of Cincinnati, under the direction of the Key Advertising Company.

Lighting for Color Shots

MORE light is required in the taking of color photographs than in black-and-white, but it must be diffused more evenly. The additional necessary light can be had simply by increasing the exposure.

Heavy shadows, so necessary in ordinary photography, usually go a dead black in a color print, while very "hot" highlights tend to wash out and glare. Therefore, the light should be fairly even, although a balanced lighting can be effected, provided there are no extremes.

Up to the present time, color reflection has remained a serious problem, especially with backgrounds. Red and blue are the greatest offenders. Red, particularly, reflects very potently, and blue is almost as bad. Green is rarely troublesome in this respect, while yellow has proved to be quite harmless.

In color portraiture, if the subject is dressed in either red or blue, the reflection is likely to "kick back" and spread over the face. The same difficulty may arise from the background. Reds and blues can be used, of course, with certain combinations, although they should be avoided in backgrounds whenever possible. A suitable color combination can be achieved with a minimum of reflection if the shot is well planned in advance.

In loading plateholders, extreme care must be exercised to avoid soiling the film. Color films can be handled only by the edges, for fingerprints that would remain unnoticed or could be easily removed from ordinary film, stand out glaringly.

How to Take Better Pictures

by AVENIR Le HEART

It is one thing to bang away at everything in sight as long as the film lasts and still another thing to make pictures having real artistic and photographic merit. This article, by an authority, should be carefully studied by beginners.

THE mechanical duty of any photographic camera is to make pictures. But the quality of these pictures wholly depends on the skill of the operator.

The market offers you a great variety of cameras. They are designed for many specific purposes as well as for broad field of personal expression. It is YOU who are responsible for good or bad in your photographic pictures. It is YOU who are the directing brain behind your camera and whose will and conception the camera will obey in performance.

At the time you have your camera set to photograph a certain object, you are naturally under the impression that it is the best and most suitable position from which to photograph. You would not waste film if you did not think so. But when you present the print for criticism you discover that the picture you took is far from being perfect and contains many shortcomings.

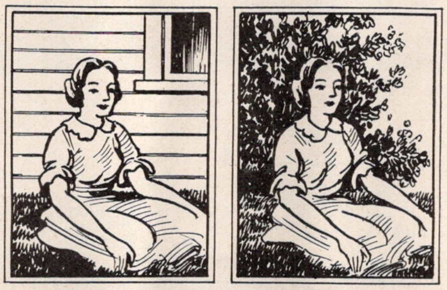
In the course of friendly criticism of your picture making, you hear that your study is "poorly balanced in composition, flat, lacking life interest, has no meaning," etc. In addition, there may be other shortages due to imperfect technical handling of the film and print.

As a matter of course, you take these helpful words of criticism with good spirit. You promise yourself not to repeat these mistakes in future pictures. Constructive criticism received from a reliable source is the best school for an aspiring photographer.

Every photographic picture is an accomplished record. It may be good and contain all of the requirements that constitute the pictorial composition. Pictorial composition requires, first of all, that the subject of interest in the picture by its placement, action and mood tells the interesting story of its character situation and definition. To recognize the pictorial value of a study is to sense its story at first glance. The pictorial study should possess the quality that would induce the viewer's mind into mood and imagination and as a consequence to the correct understanding of the concept of the pictorial story.

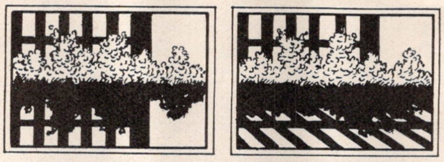
Let us illustrate it by an example. Suppose you want to photograph a little girl. The child is pleasingly dressed and adorned with all the necessary additions becoming to a little beauty. If the picture is to be taken indoors, there are several settings may be found that will support and enhance the character study of the child. She may be placed on a large soft chair with a picture book on her lap; she may be placed by the window, looking out, and her little hands pressed against the window pane, or she may be found in the kitchen by the ice box, peeking inside. Many other interesting settings of the home life may be found to help in pictorial composition that would create a picture which at a glance will tell the story and depict the character of the little girl. Telling an interesting story by the picture is the requirement of pictorial composition.

If the little girl is to be photographed outdoors, the same requirements to pictorial composition are observed and in addition the value of colors are considered. Every color of the color spectrum has its own interpretation of grey in photography. The picture will appear flat and lacking distance if colored objects composing the picture are not distinctively in contrast with one to another. Supposing the little lady wears a white dress, it would be an error to photograph her against a background that is likewise of light color quality, unless the distance between the girl and the background is interposed by graceful lines of growing plants, fancy lines of tree twigs or something in pleasing but unattractive form to break the monotony of similar colors.



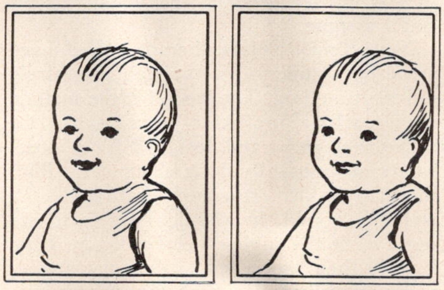
WRONG **CORRECT**

Do not pose a figure against a background that has a disturbing pattern. Place the subject against a pleasing background such as shrubbery.



WRONG **CORRECT**

Shadows thrown by vertical objects should never show vertical. Take them from a position where they "slant" across the picture as at the right. The slanting shadows denote the ground level.



WRONG **CORRECT**

Never spot the subject of principal interest directly in the center of the picture. Set the object slightly off-center as shown at the right.

On the other hand, a sudden severe contrast of colors is also harmful. To photograph a white object against a dark background will destroy the illusion of distance and will produce the effort of harsh contrast.

The pictorial composition should include mood in the picture. The viewer's mind must not only see what is in the picture but by its power, go beyond and be forced to imagine the charm connected with the pictorial print.

Again, we have to illustrate it by an example. Suppose you want to photograph a field. The stretch of a green field is always a tempting subject to photograph. As there are two large spaces occupied by colors, the green of the field and the blue of the sky, which do not harmonize very well by lack of contrast, such contrast must be found in appropriate horizon line which for the purpose may be set off by a line of distant trees or houses.

To portray distance of the field, there should not be trees in the foreground. To indicate a visual movement into the depth of the field, a pathway leading diagonally across the field may be included in the composition. The line of the horizon must be about two-thirds from the bottom of the study.

The spirit of appeal and mood is gained by showing in the foreground of the picture parts of an old fence, tall blades of grass, transparent bushes or a few stems of wild flowers. The insertion of grazing animals is beneficial to the spirit of composition. Human figures are not so appropriate unless they perform some action pertinent to the field. Picking wild flowers is appropriate for female and children figures; laboring, for male figures. For the sake of preserving the spirit of the field such human figures should avoid posing for portrait effects but be photographed as a part of the entire field study.

A pictorial study of any kind must radiate with pleasing appeal. Portraits from the Rogue's Gallery are cold matter of fact records; while the graceful studies of children, flowers and pets are subjects of interest and admiration. Such pictures become treasured possessions in the home.

In contemplating a photographic study, this spirit of appeal should be strongly considered, especially in amateur photography, where the prints are to portray episodes of a family's life. A beautiful scenic view will eventually be forgotten but the inclusion of a familiar figure in the picture, gracefully posed in action will make that study live long.

It is good to photograph a snake on the road but it is better to snap a young deer. The first will hardly ever be a winning subject for pictorial composition, the second will be admired even at the expense of the composition.

Do not place the main point of interest in the very center of the study. It should preferably be located somewhere in the area of the upper half of the study with the lower half containing leading lines and weight of colors.

The point of interest in its radiation must have sufficient area of space on the study. A portrait in profile should have enough space between the outer line of the face and the edge of the study. The line of horizon should be kept away from the center line of the study.

The line of leading movement must not be obstructed as it starts on the study. If a field has a fence in the foreground, it must show an open gate permitting progress along the pathway or road.

If the study contains long shadows, they add to conformity with pleasing composition if photographed in diagonal movement. These will serve as vital lines in composition. Many narrow shadows, like those of fence or a row of trees, may be vertical and so serve the conception of repetition which is one of the qualities of good composition.

The later part of the day is better indicated if the moving figures of the study are photographed on their way out of the picture. There is more vibration in the study if the figure is moving forward. Such conception is used to illustrate the earlier part of a day.

Observe rhythm in your pictorial studies. A beautiful girl gracefully dancing on the sand at the seashore flies her silken scarf. Her dress, her flowing hair, the shore line, the clouds, all should correspond in that movement of rhythm.

The photographic camera is an instrument to produce art. You as the owner of this art producing instrument are an Artist. In your attempts to be a photographer do not be content with just simply clicking the shutter of your camera, go farther.

You have a great sphere to explore and conquer by thinking, by research and by perseverance. Do not become a dark room crank, where only mechanical perfection is the goal, but rather develop that ability to perceive and capture pictures which are standards of art.

END

An Invitation

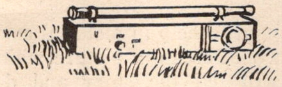
Popular Photography will select one outstanding pictorial print each month to be featured as the PICTURE OF THE MONTH. Pictorialists from all over the world are invited to compete for this selection. Amateur prints will be given the same consideration as professional. Monthly award: $25.00.

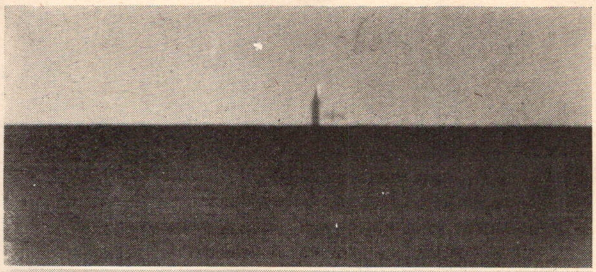
Sufficient return postage must accompany all contributions. The name and address should appear on the back of each picture.

Every precaution will be taken, but Popular Photography can assume no responsibility for the safe return of prints submitted.

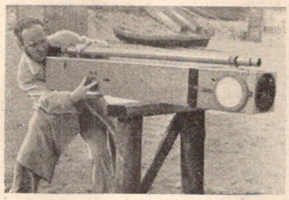
Camera Proves World Is Round

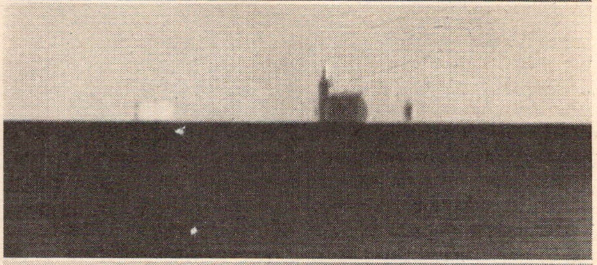
Here, the camera is flat on the ground. Seven miles away only the steeple-top is visible.

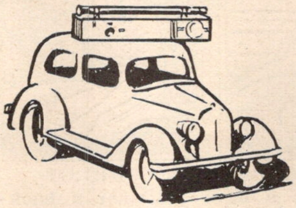


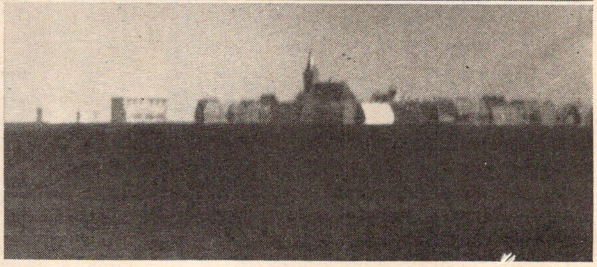


On a 3-foot ledge, the tops of several buildings can be seen.









Perched on top of an auto, the camera sees almost all of the buildings.

For thousands of years, scientists have offered proof that the earth was round, and although no further proof seems necessary, the camera in recent years has offered its own final conclusions in the matter.

Not long ago, scientists using powerful cameras with infra-red filters and negatives took air views at a two hundred mile distance which distinctly indicated the curve in the horizon. That was proof no one could dispute.

Now comes still further proof achieved again by a camera, but through an entirely different method. The basis for the method used is a long box-like camera invented by a Dutch scientist and designed for photography at unusually long distances. This modern Galileo reasoned that since the world is round, he should be able to see more of it the higher he rises away from it. He then proceeded to demonstrate his point by the series of photographs reproduced here.

The first photograph above was made with the special camera placed on the ground and shows a village on the famous Zuider Zee in Holland. The village is seven miles distant and the photograph, as you can see, takes in only the top of the church steeple, the tallest point in the village.

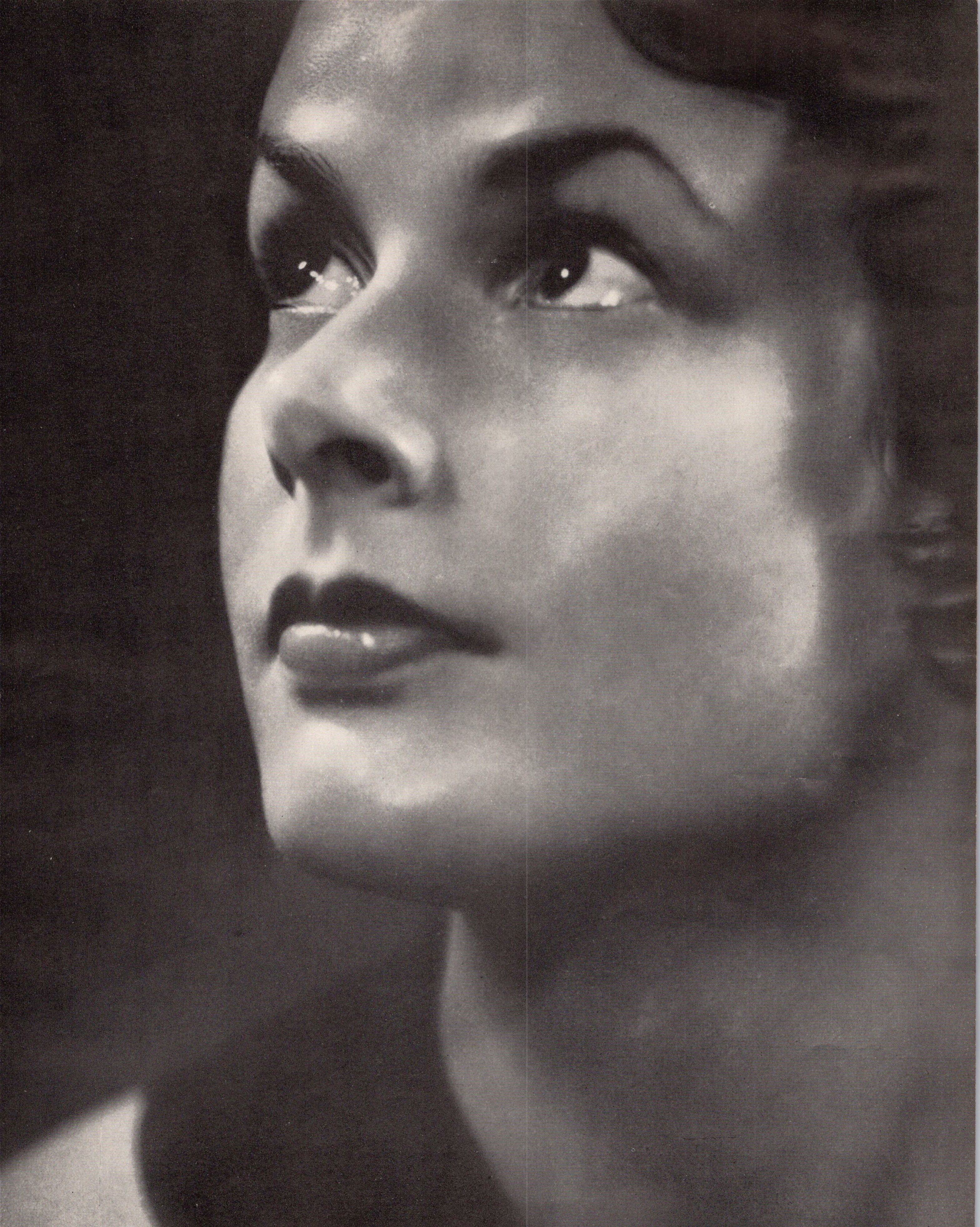
Next, we see a photograph made at the same distance but with the camera resting on a support midway between the top of the car and the ground. Notice that here the photograph shows only the upper half of the taller buildings.

In the final photograph, the camera has been perched on top of an automobile and now takes in the buildings on the opposite shore in their entirety from the ground up.

It naturally follows that what is beyond (or below) the horizon can be seen as we move upward, and becomes concealed as we move downward. In this novel experiment, the effect of the series of photographs is that of letting us look around the curve of the earth.

PICTURE OF THE MONTH

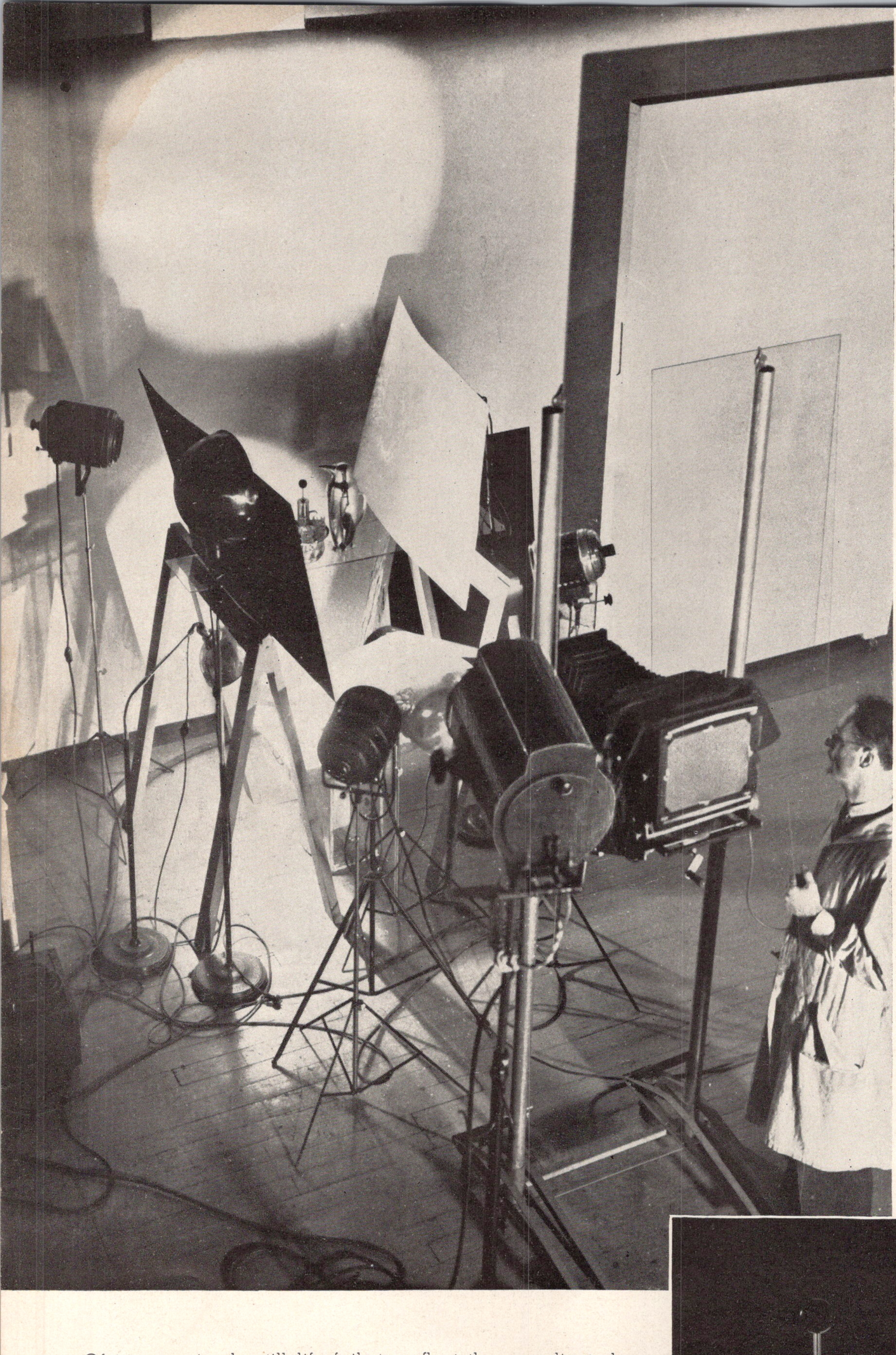
★ Our selection for May, 1937: FAITH by Don Wallace, leading Illinois pictorialist. Data: Eastman Studio Camera, Vitax portrait lens. Defender X-F pan film. Three photoflood spotlights were used, 1/5 second at f 8. All make-up was removed from the face, which was then coated with a thin covering of light oil.



FAITH

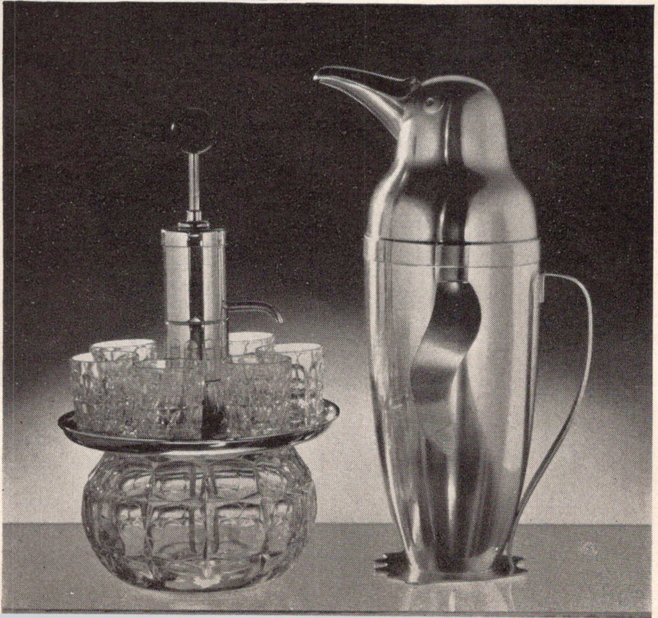
Don Wallace

STILL LIFE



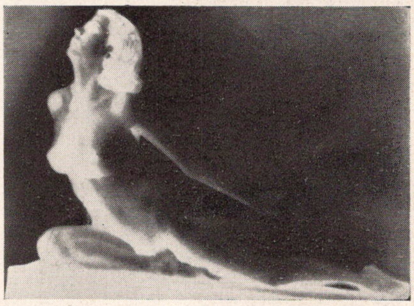
Ofttimes a simple still life fails to reflect the complicated problems which faced the photographer. The photograph at the right, taken by Tesla Wineman Barker, Chicago illustrative photographer, required the complicated lighting arrangement shown above. In this instance the difficulty arose from the highly polished surfaces which, like mirrors, reflect the tone and shape of their surroundings

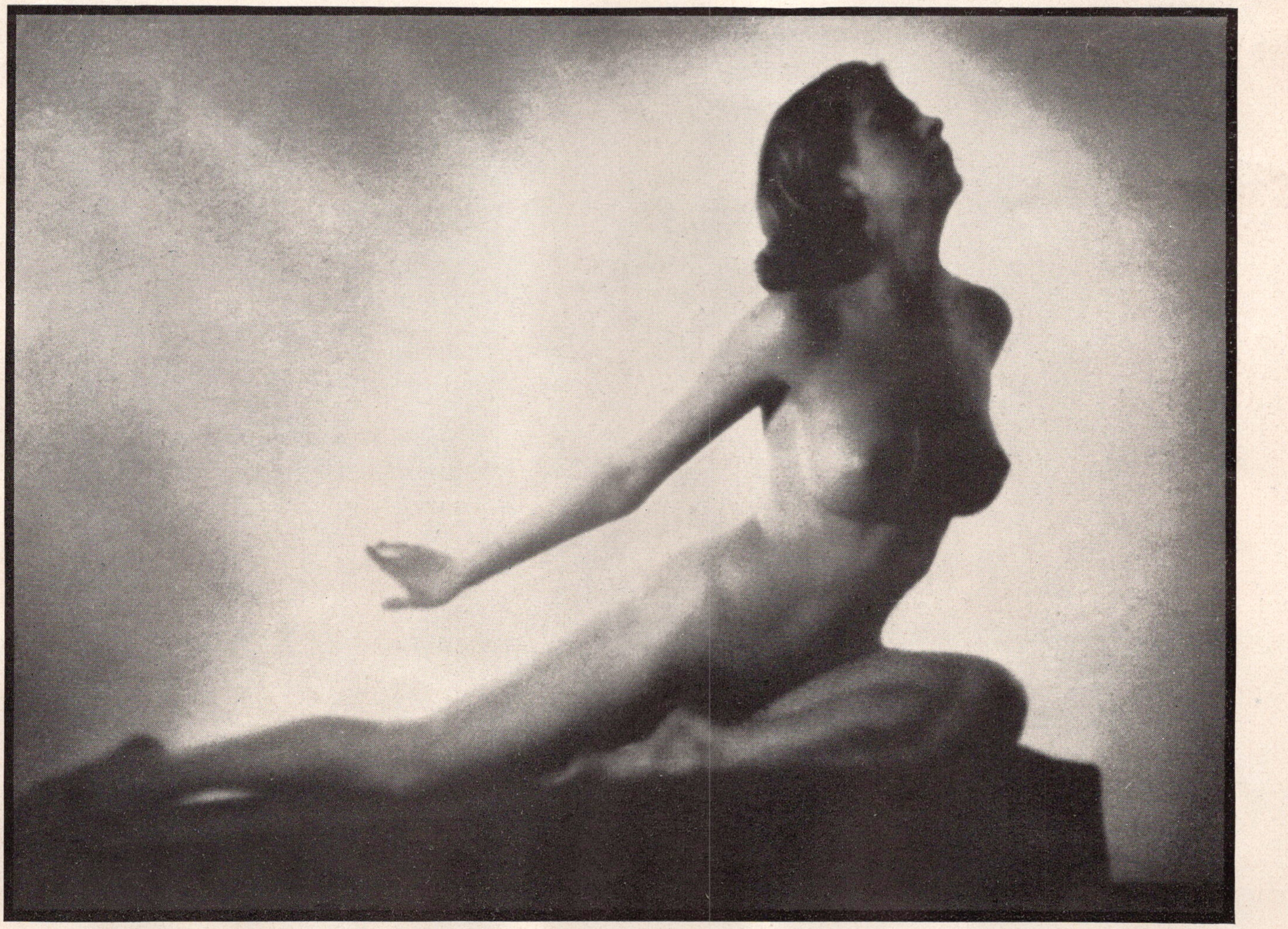
DATA: 8x10 Deardorff camera 18" B & L Apochromatic Tessar, 45 seconds at f 64 on Eastman commercial film. Azo print. Taken for Fred Harvey, Inc.



A PRIZE NUDE . . .

Successful nudes are rare, but Lionel Heymann, active Fort Dearborn Camera Club member, has achieved noteworthy success with this type of picture in salon competition. Below is reproduced one of Heymann's popular nude studies, hung to date in nineteen different salons, not counting dozens of camera club exhibitions. At the right, is Mr. Heymann in a characteristic pose. Right center, a few of the trophies won by this striking picture; at the lower right, a stage in the paper negative process, which was used to obtain the strong background effect





DATA: 3¼ x 4¼ Graflex, 7¼″ Schneider Xenar, f 3.5 stopped down to f 8. Exposure 1/5 second on Eastman portrait panchromatic film. Paper negative on single weight PMC No. 2 normal

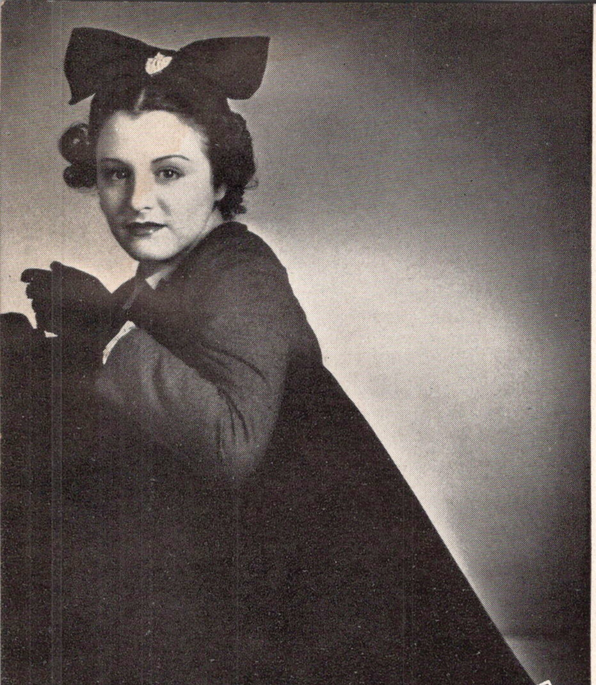
Lionel Heymann

HOW WOULD YOU TAKE HER?

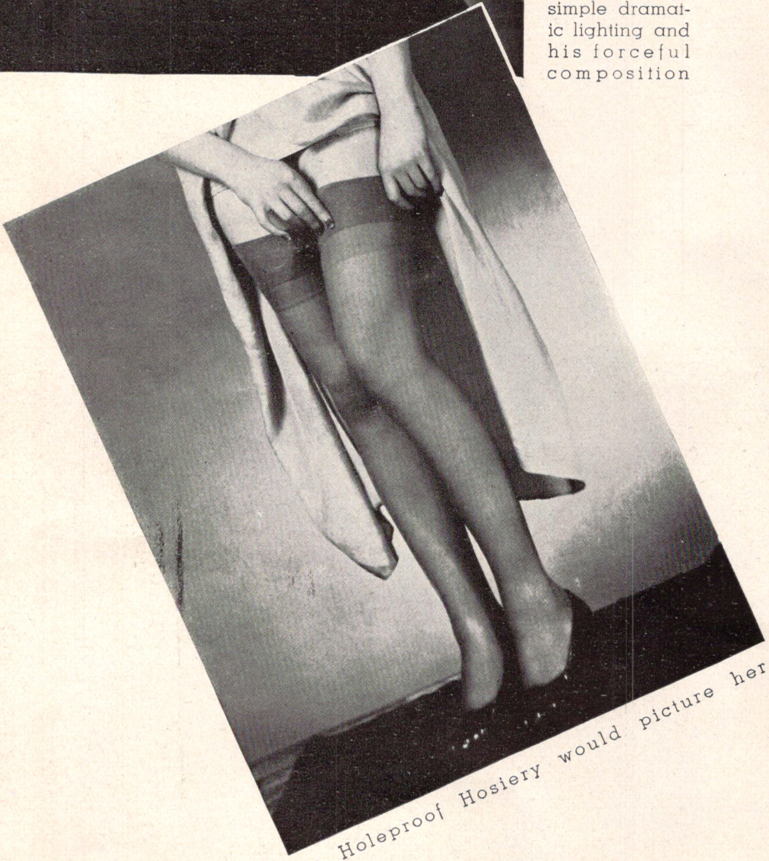
By Jack Hazlehurst

We present a group of photographs, all of the same model, as she would have been posed by well-known photographers

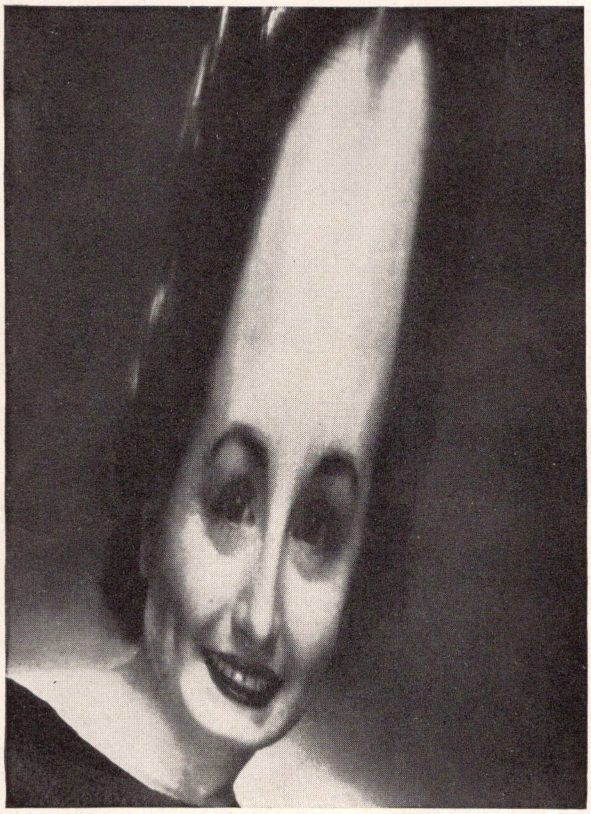
Photographer: Jack Hazlehurst, prominent pictorialist, makeup expert
Model: Miss Linda Yale, now Hollywood bound



As Steichen would take her, famed for his simple dramatic lighting and his forceful composition

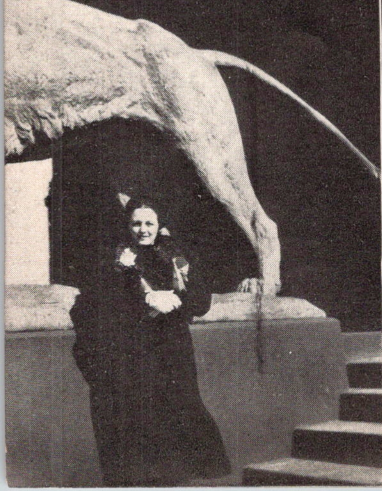


As Holeproof Hosiery would picture her



As Man Ray might depict Miss Yale's soul. No one but a surrealist can understand the meaning of this shot

Somebody's snapshot



At the candid camera's mercy

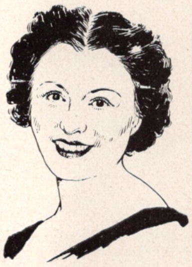
Ready for the show-up

5526893

By a press photograqher

Linda in the hands of
a Hollywood still man

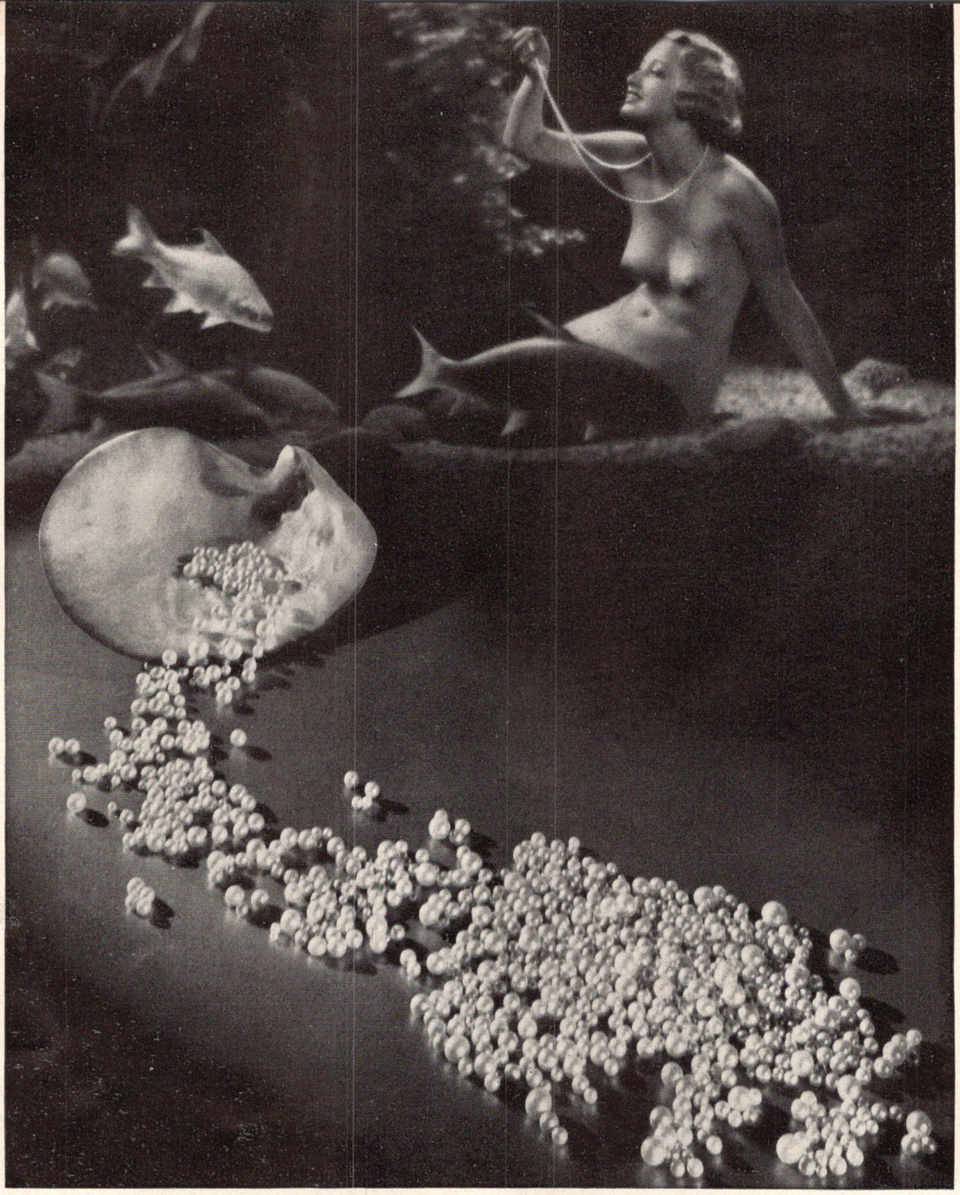
As
VOGUE
would
pose
her



We wanted a true picture of
Linda for our readers. After
seeing the shots on this page
we trusted Jack no longer. The
staff artist offers a lifelike sketch

Mortensen, famed pictorialist of California, master of bizarre technique, might take our heroine thus

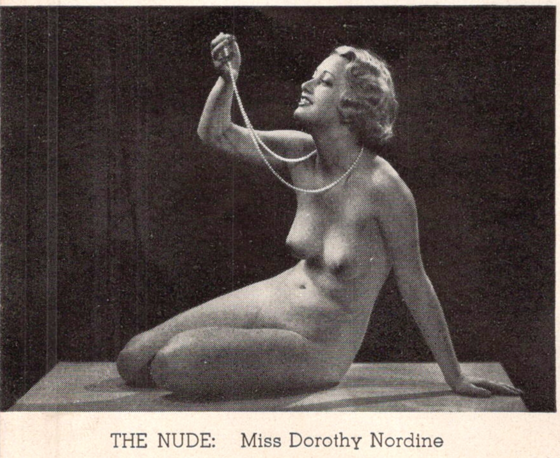
MONTAGE



PEARL STUDY

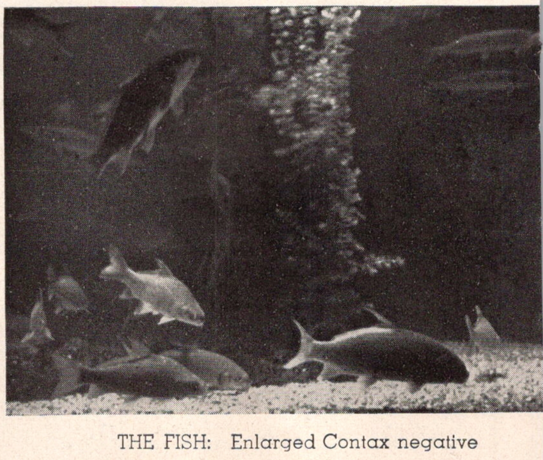
By H. K. Shigeta

The beautiful Montage shown above was made from three separate negatives, carefully matched and superimposed. The finished print made for Mikimoto Co., originators of the cultured pearl, has been hung in many salons. The individual negatives, before being merged, are shown below



THE NUDE: Miss Dorothy Nordine

THE PEARLS

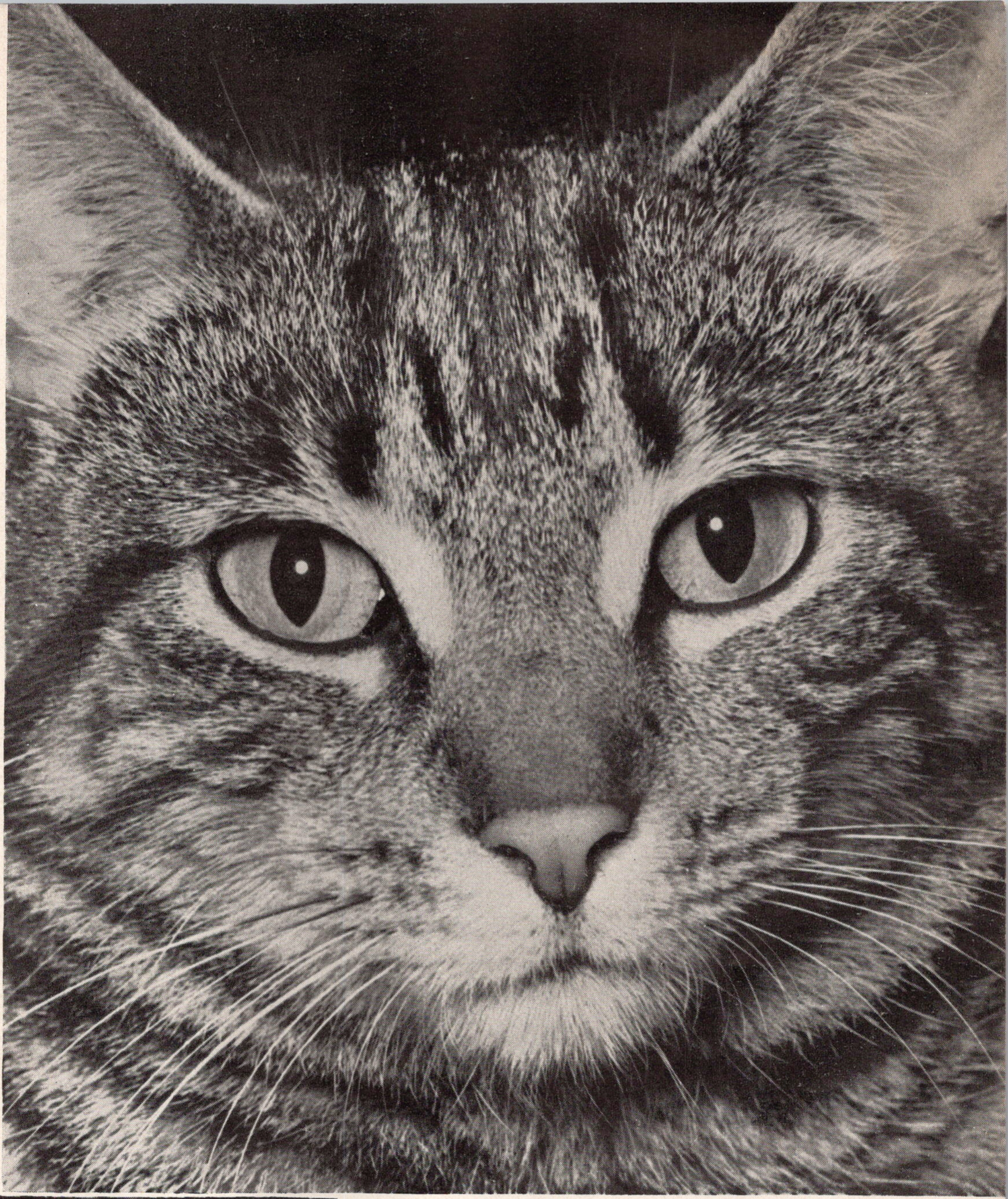


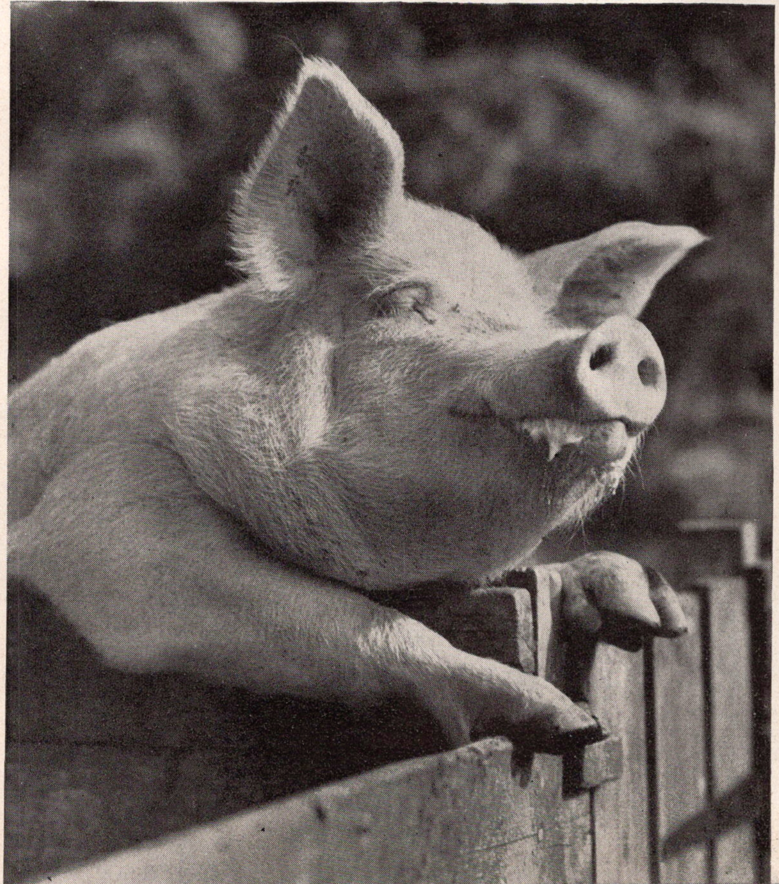
THE FISH: Enlarged Contax negative

THE CAT'S WHISKERS

By Fred Korth
Chicago, Illinois

DATA: 5 x 7 Deardorff Camera; 9½ inch Schneider Xenar f 4.5; three photoflash bulbs at f 16. on Agfa Superpan





THE PIG'S KNUCKLES

By Harold Burdekin
Reigate, England

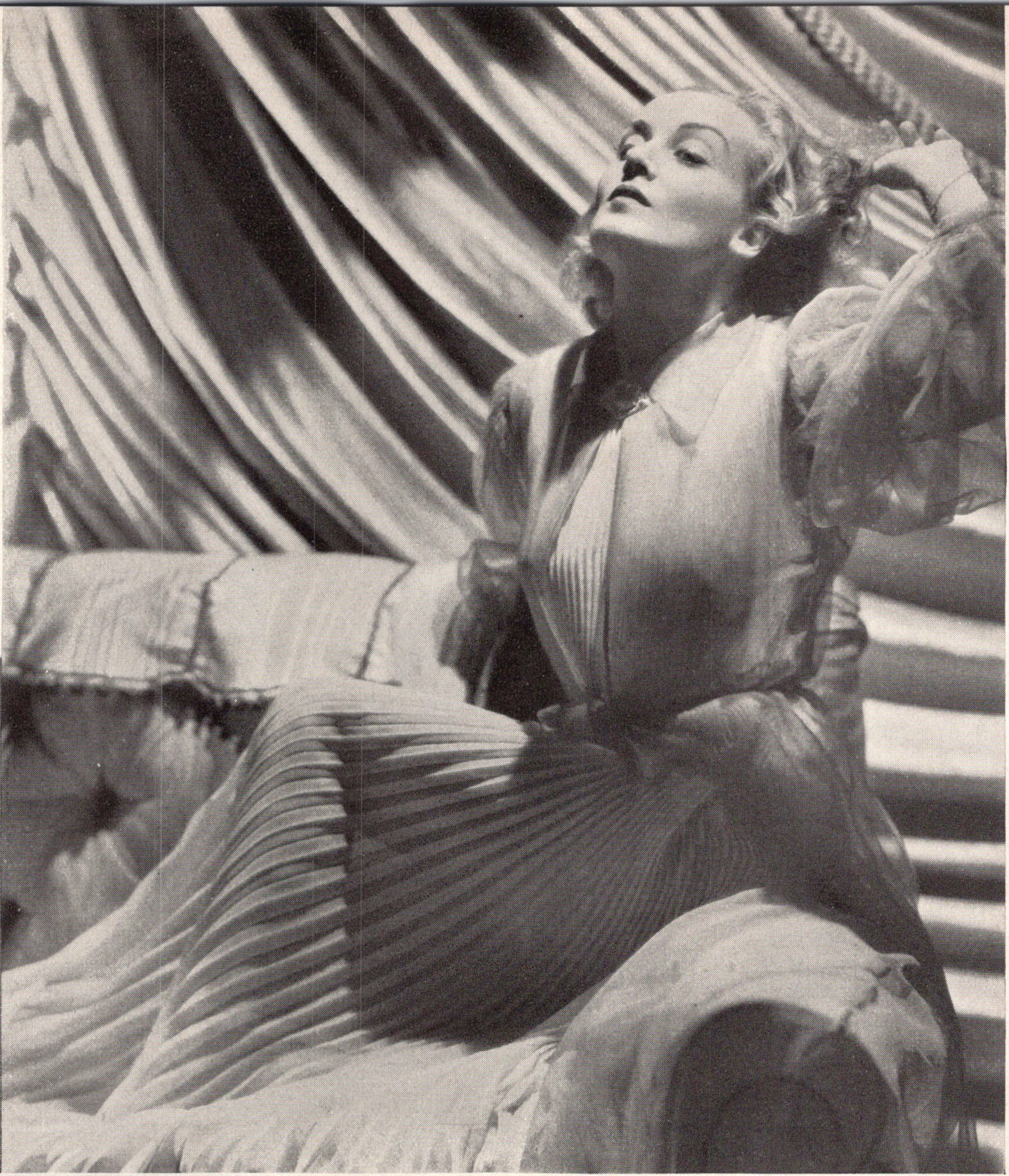
DATA: Made on a sunny winter day, with a Zeiss Nettel Camera. Exposure 1/25 second at f 5.6 on Kodak S. S. panchromatic film

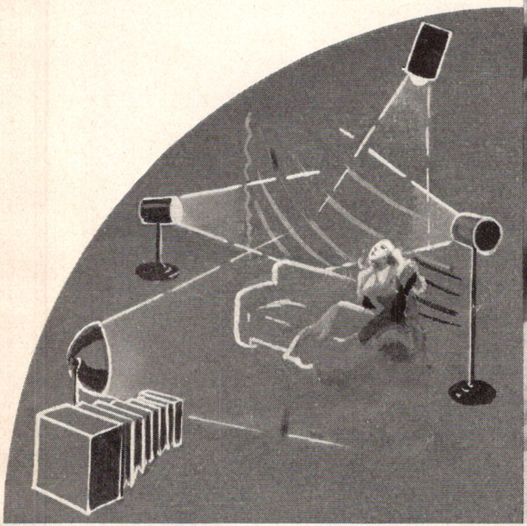
CAROLE LOMBARD

By William Walling

★

Selected by Paramount
Pictures as their
outstanding still
of 1936





DATA. 8x10 Century Studio camera; Eastman Portrait Pan. $\frac{1}{2}$ second at f 11. Two 35 amp. arc spotlights on background. One high spotlight on face and body; 500 watt flood lamp for shadow fill-in. (See diagram)

★

LEFT: Another portrait study of Miss Lombard, likewise brilliantly handled by the photographer but withheld from general release due to the rigid restrictions of the Hays office

Make Your Camera Pay Profits

by JOHN P. LYONS
Editor of PHOTO MARKETS MAGAZINE

Every camera owner at some time takes shots which have substantial sales value. The writer, a national authority in this line, tells you exactly how and where to sell your prints.

ONLY a photo-fan realizes the lure of new equipment, gadgets and accessories. Impelled by this temptation it is no wonder that many camera owners are today seeking a way to turn their hobby into profit.

Fortunately for us camera owners, there is a rapidly growing market and need for photographs. Every newspaper from the largest to the smallest is trying, today, to tell the story in pictures. Staff photographers are being overworked and publishers are more and more supplementing their supply with paid contributions from outsiders.

Magazines are even more in need of photographs and solicit every kind and variety from whoever is qualified to fill the demand. Few magazines can afford staff photographers of their own and hence rely on contributions from free-lance photographers, professional as well as amateur.

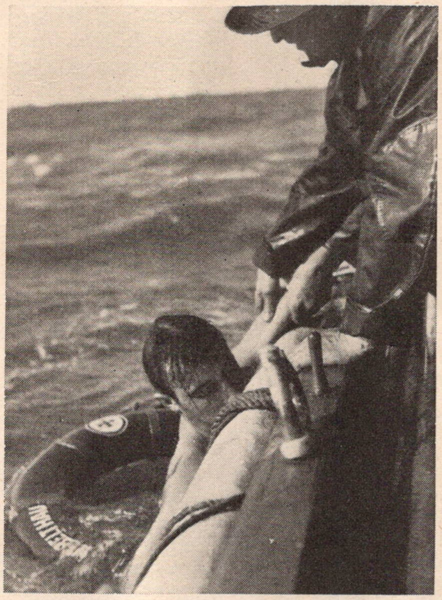
At the request of the editor of POPULAR PHOTOGRAPHY, I intend to indicate in this article all the important markets for photographs as a guide to amateurs and professionals who want to know exactly where to submit their pictures, what kind, and how much revenue can be expected.

Two very recent and important markets are the picture magazines, *Life* and *Look*; both of which tell the news exclusively in pictures.

Life is published weekly at 130 East 42nd Street, New York and *Look* is published monthly at 715 Locust St., Des Moines, Iowa. Both magazines invite amateur and professional alike to submit pictures they think might be suitable for publication, and offer to pay top prices. It is best to study what is being used in these papers at the present time and bear in mind, pictures must contain great human-interest, or national significance, and be excellent pictorially.

Perhaps the quickest entry into profit photography is the accident picture, fires, floods, tornados, and such disasters that are generally "lucky" shots, being on the spot at the psychological moment. Local newspapers buy direct only views of local accidents and get their national and international event photographs from the great syndicates like Acme Newspictures, 220 E. 42nd St., New York; Associated Press News Photo Service, 383 Madison Ave., New York; Chicago Tribune Newspaper Syndicate at Chicago and New York; Ewing Galloway at 420 Lexington Ave., New York; Globe Photos at 33 West 42nd St., New York; Underwood and Underwood News Photos at 242 W. 55th St., New York. These syndicates will all buy exclusive photos of disasters of national importance, or involving some celebrity of national importance. And of course they pay handsome prices for the unusually important pictures.

Insurance trade papers and many different magazines will buy accident photos for use in their publications, to point out the moral of accident-prevention and the advisability of insurance protection. Here are several with the prices offered. Insurance Pictorial, 222 East Ohio St., Indianapolis, $1 to $5 for "news photos of all kinds of insurable disasters, with statement of the loss, damage, insurance coverage, etc." Emancipator Magazine, c/o Lincoln National Life Insurance Co., Fort Wayne, Ind., offers $5 each for "news photos of current events pointing a life insurance moral." Life Underwriters News, 901 Commerce and Transportation Bldg., Toronto, Ont., Can., offer $5 to $10 for "photos which can be used to illustrate some angle of life insurance protection." The Fireman's Fund Record, 401 California St., San Francisco, Calif., offers "from $2.00 to as high as $10 or $12 for pictures of fires, marine disasters, automobile wrecks, rioting, etc." Locomotive Magazine, c/o Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn., "$5 each, damage and destruction caused by explosions of boilers and hot water tanks in industry or factories." Brake Service, 209 Buckeye Bldg., Akron, Ohio, $2 for photos "of bad auto accidents pointing a 'good brakes'" moral. C.I.T. Safety Foundation, 1 Park Ave., New York, offer an annual series of awards, with prizes running as high as $100.00 for published photos which do most to present the moral viewpoint. They will send you an entry blank and list of awards for a three cent stamp.



Saving a man from the wreck of the Elsie Schulte, which was broken up in a storm, 1926. This fortunate snap-shot, as might be imagined, brought a fancy price.

Have you noticed the news pictures displayed in store windows to attract attention? Elliott Service Co., 242 W. 55th St., New York, and Illustrated Current News, New Haven, Conn., publishers of such photo services, want all sorts of accident photos, as well as generally interesting subjects in all fields, paying first class rates for accepted work.

Next to the "lucky" accident shots—perhaps the easiest market for the beginner is the popular science and mechanics group. These magazines use many thousands of photos every year, the better ones paying top prices for the work accepted. You are undoubtedly acquainted with the type of material published, views of home-workshop arrangement, how-to-make things, mechanical oddities, etc. Perhaps you have a friend who "tinkers" in a home workshop. Photos of his shop and the home-made articles he has produced might interest this group. Generally a short description or caption must accompany the photos but this is easy; merely state the particulars and data in letter form and the editor will revise. Everyday Science and Mechanics, now at 800 North Clark St., Chicago. Homecraftsman, 63 Park Row, New York. Homecraft and Hobbies, 142 W. 24th St., New York; Mechanics and Handicrafts, 22 W. 48th St., New York; Modern Mechanics and Inventions, 22 W. Putnam Ave., Greenwich, Conn.; Popular Homecraft, 737 N. Michigan Ave., Chicago; Popular Mechanics, 200 E. Ontario St., Chicago, Ill.; Popular Science Monthly, 353 Fourth Ave., New York, and Scientific American which leans more to scientific material.

The ruralite may think he has no opportunity. Yet the agricultural and mail-order papers of the country are using an increasingly large number of photos. Most in demand are good, human-interest pictorials for front cover pages. Mr. Arthur Jenkins, editor of the great Farm Journal, Washington Square, Philadelphia, Pa., recently wrote me he cannot get good "landscapes, showing beautiful, rural scenes in all parts of the country excepting New England, New York and New Jersey." He offers to pay $25.00 each for such but they will have to be exceptionally fine photography, not smaller than 5x7 size prints. Other farm papers calling for cover page photos, together with prices offered are Agricultural Leader's Digest, 139 N. Clark St., Chicago, agricultural subjects, $5; American Fruit Grower, 1370 Ontario St., Cleveland, Ohio, $1 up for good orchard or packing scenes; American Fur Breeder, 304 So. Minnesota Ave., St. Peter, Minn., fur animal scenics, $3.00; Better Crops with Plant Food, Investment Building, Washington, D. C., $2.00 for human-interest agricultural subjects; Canadian Bee Journal, Oshawa, Ont., Can., scenic, human-interest bee pictures, $1.00; Capper's Farmer, Topeka, Kans., highest rates for "striking subjects to contain human or animal interest, scenes in which machinery figures, unusual farm action or striking pictures of individual animals." Country Gentleman, Independence Square, Philadelphia, also offers highest rates for single photos of "farming or kindred subjects, country-life, human-interest, etc."; Dairy Goat Journal, Fairbury, Nebr., scenics of dairy-goat interest, $1 to $3; Everybody's Poultry Magazine, Hanover, Pa., $2.00; Farmer (Farm, Stock and Home), 57 East 10th St., St. Paul, Minn., promises good rates for suitable "human-interest photos, and general farm scenes which might be used to illustrate farm feature articles."

Every year I receive thousands of letters from camerists, amateur and professional. A frequent question is, "Can a woman succeed in this field?" And the answer is emphatically, "Yes!" A roster of the country's leading pictorialists would include a surprisingly large number of woman. I know one who specializes in aerial photography, perhaps the most difficult branch. Newspaper page section, feature homemaking and women interests, fashion shows, child welfare, etc. Many national magazines are devoted exclusively to women's interests and these encourage contributions by their women readers. Most generally, they wish material presented as articles, accompanied with suitable illustrations, but many buy single photos. We list a short selection. Everybody's Health, 11 West Summit Ave., St. Paul, Minn., photos with a health slant, $3.00; Light Magazine, La Crosse, Wis., $5 each for home scenes, healthy babies and children, and scenes in which they appear illustrating healthful sports, etc.; Physical Culture, 122 E. 42nd St., New York, $5 each for baby photos, pictures of grace in women and health in men, especially, "babies and body beautiful, but no nudes"; American Home, 444 Madison Ave., New York, N. Y., $3.00 for single photos of exceptional home interiors, also page spreads of such; Babies Magazine, 1221 Beaufait St., Detroit, Mich., $3 to $5 for professional photos of healthy babies, photos suggesting use of milk, anything illustrating comfort and convenience for babies; Better Homes and Gardens, 1714 Locust St., Des Moines, Iowa, $1 to $5 for views of the smaller, distinctive homes and gardens found in suburban sections, garden flowers, lily ponds, fruit and vegetable home gardens, interiors and exteriors of moderately priced homes; Bride's Magazine, 271 Madison Ave., New York, fashion studies and candid informals of young brides; Delineator, 161 Sixth Avenue, New York, single photos of interiors, foods, fashions, children and well-known personalities; Farmer's Wife, 55 East 10th St., St. Paul, Minn., $1.50 to $5 for home activities in rural living; Garden Digest, 469 Great Oak Lane, Pleasantville, N. Y., want views of flower gardens and garden subjects.

Gentlewoman, 154 W. 14th St., New York, N. Y., $2 to $5 on food, beauty and gardening to interest the small-town woman; Grit, Williamsport, Pa., $1.00 to $1.50 for oddities and out-of-the-ordinary things, freaks of the animal and vegetable

(*Concluded on page 73*)

Print Criticisms for Our Readers

This service, which is free to all our readers, will be of help to beginners in the art of photography. Send your prints to Print Criticisms, POPULAR PHOTOGRAPHY, 608 S. Dearborn St., Chicago, Ill. Prints will not be returned.

EACH month POPULAR PHOTOGRAPHY will accept from readers a limited number of prints for criticism. If you have some prints which you suspect are not technically correct, particularly where a point is involved that has not previously been discussed in this column, send your print to this department.

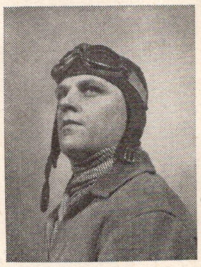


Photo by H. L.

H. L.—Your print is well posed and technically quite good. Your error lies chiefly in the lighting. Your subject is intended to be outdoors, hence your print should carry an outdoor atmosphere. There is not enough contrast to the picture. This contrast could have been obtained by increasing the intensity of the main light directed at the subject's face, which would give more the appearance of strong sunlight.

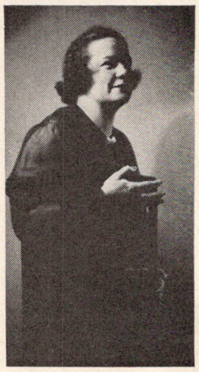


Photo by D. H.

D. H.—The shadow side of the face does not have enough illumination. This could have been secured by the use of a second source of light pointed at the shadow side of the face from close to the camera. This light should not be as strong or as close as the main source of illumination. Another way of securing this balance of high-light and shadow is by using a reflector, a large piece of white cardboard or in emergency, a newspaper spread out so that some light from the main source is reflected into the shadow side of the face. We would suggest trimming about one-third off the bottom of the print also.

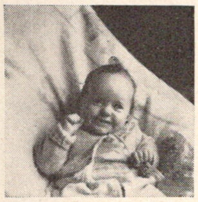


Photo by M. J. C.

M. J. C.—This is a very pleasing, informal portrait of a baby in a pleasant mood. Technically the picture is quite good, but we would suggest trimming off the top much closer to the head and also a little off both sides. However, this still leaves a disturbing dark triangle in the upper right hand corner. In arranging pictures of this sort it is well to keep the background in one general tone. Baby pictures are best shown against the light backgrounds. There is no objection to trimming off the baby's feet; it is far better than they be off than that they appear out of focus in the picture.

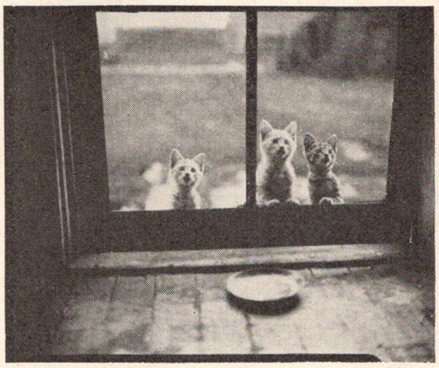


Photo by B. D.

B. D.—This is a pleasant human-interest picture. About one-third of the lower part of the picture should be trimmed. Under different circumstances this lower part could have added materially to the picture, since it conveys the idea of hungry kittens seeking their milk. Unfortunately, however, the lighting in the foreground and in the pan is a bit too strong, too distracting, and besides it is out of focus. It could be helped considerably by darkening the foreground in printing.

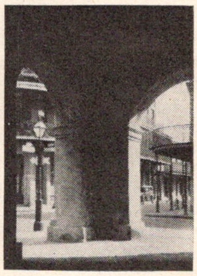


Photo by J. A.

J. A.—This picture seems to divide into two areas of almost equal interest. We are constantly looking first from one archway and then the other. In shooting pictures through archways, try to show the complete opening if possible, but in any case have only one central point of interest.

A Startling Apparition

EVEN after every precaution has been taken in loading the camera, you may frequently find a round fogged spot in the center of the film or plate that is a puzzler until a considerable amount of experimental work has been done on the camera.

This, in most cases, is caused by closing the camera bellows too quickly, which compresses the air at the back of the lens and momentarily opens the shutter. This may be avoided by closing the bellows slowly or by cutting off the corners of the ground-glass focusing screen so that the air can escape readily.

Camera Census

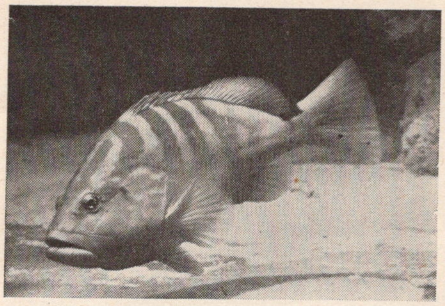
CONSERVATIVE estimates place the number of cameras in the United States at 16,000,000 units, ranging from the 39-cent Bazookus to Leicas and Contax.

A brief survey made by the staff of POPULAR PHOTOGRAPHY indicates that the great majority of people have owned a camera at one time or another during their lifetime. This a record not equaled by any other hobby, not even radio.

Candid Shots in a Fish Tank

by PAUL W. KEARNEY
Author of STRANGE FISHES

For those who wish to test their prowess with a camera and to test the quality of their nerve stamina and patience, we advise them to take up the enthralling sport of photographing fish. And the writer has the real dope on the situation as you will quickly see.



Here we have a nervous Nassau Grouper.

HUNTING with a camera is an old and fascinating pastime—but have you ever tried fishing with one?

I have. And, although the prey were all captive fishes in tanks, the game really appeals to me quite as much as angling with a hook and line except for the very important drawback that you can't eat what you catch!

However, there are plenty of fish stores to take care of that. So if you'd like to make a sport out of your photography, or if you would like to do something constructive with it, pet fishes have much to offer.

The field is big because tropical fish breeding is a hobby that has swept the country during the past six or seven years. Which means that even if you have no subjects of your own to work on, there are plenty of your neighbors who have. What's more, good fish pictures are scarce, hence a good library of fish negatives has a real educational worth as well as a certain money value, too.

Fanciers run the scale from highschool boys to millionaires and, in the upper brackets you will find some willing to pay money for good shots of their prize beauties.

There is also a possible market among the pet pages of newspapers and magazines and an even better sales opportunity among the editors of juvenile publications who are always susceptible to good pictures with an unusual or interesting story behind them, 100 to 200 words in length. Frankly, I never cultivated this field as I should have because of the pressure of other things, yet I managed to take in slightly over $1200 in two years from a fish picture "side line."

That's only one angle, to be sure. From the purely pictorial standpoint, fishes are wonderful camera subjects and they possess, for the man who hangs exhibition prints, the rare attribute of impressing even the layman with the difficult problem involved. As a matter of fact, they appear to be much more difficult than they actually are for your real problem in this work is not technical, but personal: i. e., patience.

You will find this doubly true if you do any work in public aquaria, where you encounter the six to ten foot exhibition tank, or if you work among fanciers who have these so-called "community tanks" of tropicals containing a dozen or more fishes each going his own sweet way in utter disregard of your wishes.

The simplest method, obviously, is to work on one or two fish at a time and this, fortunately, is most often desired where you are trying to show the characteristics of a particular species. It is customary to show the male and female, but this need not be done on the same negative necessarily.

The best system for this type work is to use the smallest available tank for the "studio," putting one fish in it at a time. The bottom should be covered with white gravel, not only for naturalness, but also because this provides an excellent reflector, and against the rear of the tank (outside) you should lean a piece of opal or ground glass as large as the tank.

Two feet or more behind this ground glass lay a 100 or 200 watt bulb so that you get an even diffusion of its light over the background, thus providing a clean-cut, dead-white ground against which to show the fish. If no ground glass is available, the same result can be obtained with a couple of layers of crepe or tissue paper pasted against the back. Be sure to put the paste only around the edges, however, and be very careful of the position of the backlight so that it will be evenly diffused.

You should also equip yourself with a sheet of plain glass just wide enough to fit inside the tank snugly and just as deep as the water.

This rests in the back when not in use: its function is to push the fish or fishes up forward and limit their field of action to a minimum. Of course, you will always give the fishes a few minutes in which to quiet down after being transferred.

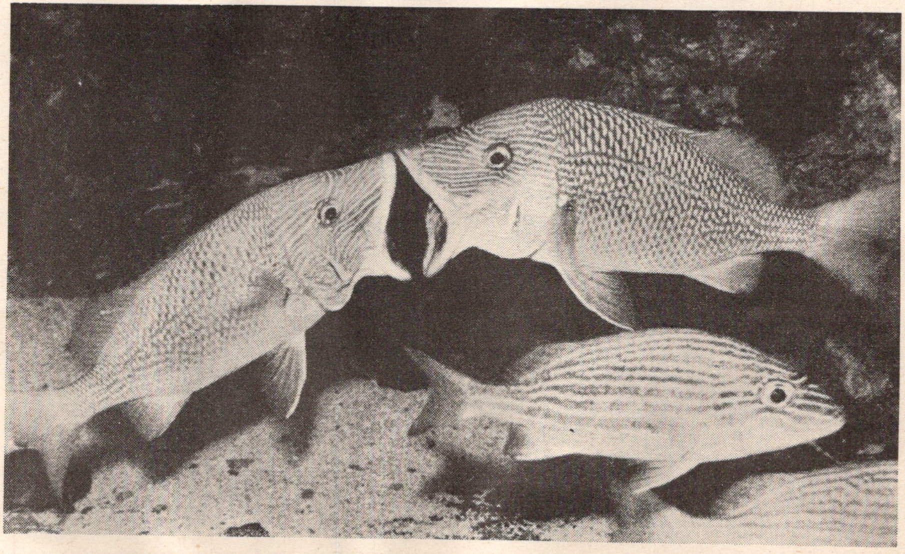
But when they do get over their excitement, you can then gently move the pane of glass forward until the fishes no longer have room to turn around. Once you've done this you'll see the reason for using as large a glass as possible, for these devils are marvels at jumping over the top of it or darting around the edges if the space is available!

With the subjects confined, as far as focal depth is concerned, you can then focus on them without undue hurry and you can shoot when you are ready, safe in the knowledge that they'll remain in focus.

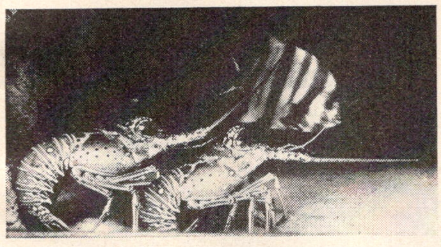
For illumination in this type work I have never used anything but one photoflash bulb (standard size) in a reflector 20 to 24 inches *above* the tank. Whenever it is possible to put the light source over the water rather than in front of or at the sides of the tank, it is preferable to do so because you thus minimize reflections and get better penetration with less refraction.

I always carry a photoflood bulb along and juggle the angle of my reflector with that in it before doing any shooting, watching carefully *in the camera ground glass* for any dangerous reflections from the tank. Once this is set, you don't have to worry about it any more unless you should bump into the reflector and move it. Which you will, more than once!

With a single flash bulb at this distance, I usually expose at f8 on a Wratten & Wainright Hypersensitive Panchromatic plate. (Roll film or film pack users will find supersensitive panchromatic films



A pair of Yellow Grunts at their favorite pastime—kissing. It took three hours of anxious waiting before they lined up for the camera. The image on the negative is only ¾-inch long.



These crayfish are true to nature, even to the dots and markings on their shell.

slightly slower.—Ed.) I use plates merely because they take the punishment of my hotbox enlarger better than films; I use pans because I just naturally standardized on them long ago for every job except where they were definitely "contra-indicated." For some very tiny fishes or for some large groups where it was necessary to stop down farther for greater depth, I have used Ilford's 8,000 H&D Hyper Pan with very gratifying results, but the ordinary requirements of this work hardly justify such an expensive emulsion. For those difficult occasions, however, it does enable you to cut the lens down to f4.5 which is a godsend when you need depth.

More than half of my fish pictures were made without a synchronizer by the open-shoot-shut method—which is all right when you get the three operations in their right order! To save strain on the arm I usually put the bulb in a regular floor stand reflector, firing it from the extension cord switch, rather than use a hand gun which is not only tiresome for this kind of work, but highly productive of reflections when you don't hold it at exactly the proper angle.

When the synchronizer was added (with the reflector attached to the camera) it became necessary to tilt the tripod top several inches so the light would hit the tank glass at a definite, downward angle and then deflect into the water. If you shoot straight at a tank, all you'll get will be a lovely picture of a flash bulb going off!

As to handling fishes, the best thing to be said is let the owner handle them if they're not yours—and by "handling," of course, I mean transferring them with a dip net, not with your hands. If the question arises, you can assure the owner that the flash bulb will not hurt the fish. But out of plain decency, don't subject them to the painful glare of a brilliant focusing light any more than is absolutely necessary. Ordinarily, I focus on a dip net hung inside the tank close to the front, but where it is essential to use a fish, I make it short and sweet.

The main thing to remember is that the creatures are naturally agitated at being transferred, so it takes a few minutes for them to settle down. For that reason it is wise to take your time about pushing them up front with the glass partition else they're liable to get hurt in the scuffle —or even jump clear out of the tank.

When you encounter the community tank with a lot of fishes in it and considerable water foliage, you can still use your illuminated background (although not as successfully) but your other illumination will have to be adjusted to meet the conditions.

A thickly planted tank may cut off a top light entirely, hence you will have to

(*Continued on page* 67)

Human Interest Without Humans

by William R. Nielsen

Art Director, Florsheim Shoe Co.

IN the movies, the radio, and in the advertising as well as the editorial pages of our magazines and newspapers we look for human interest. When we don't find it we are dissatisfied; we feel that in some way we have been let down. We say, "The program wasn't so good today"—"The ad for Blimp's Dog Food isn't up to the usual standard"—"They're slipping."

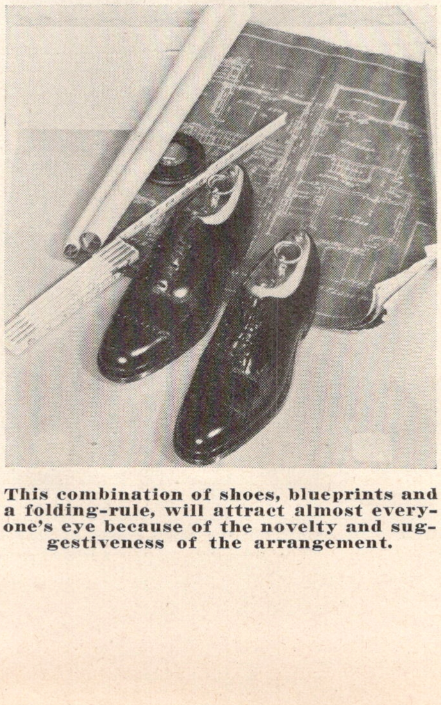
The reason for our feeling is that the appeal to us—the human interest—has been left out and our response is luke-warm, or oftentimes, completely lacking. This is perfectly natural because we, as human beings, are interested in the actions of other human beings.

What is human interest? How can we get this highly desirable quality into pictures? Human interest is that kind of interest or attraction caused by the presence of human life and activity. The obvious way of getting human interest in a photograph then, is to have one or more persons in the picture. Often, however, this particular method may be impracticable, or even impossible, and some other way must be found. This is not exactly difficult but does require some thought and keen attention to detail. For example, here are several photographic compositions that may have human interest without humans.

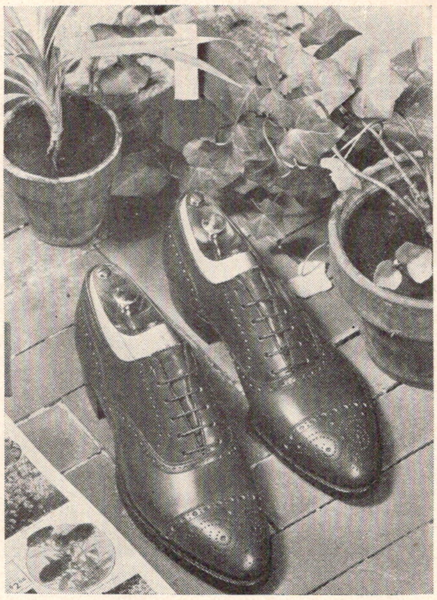
Obtain the following props: Glass of milk, box half full of crackers, child's plate (one of the Mother Goose variety, for instance) and a high-chair, if available.

Then follow this procedure: Drink most of the milk, set the glass on the tray of the high-chair or edge of a table, group the half full box of crackers, open of course, and place the plate near the glass, put part of a cracker on the plate, scatter some crumbs about, etc.

Another example is "the ol' swimmin' hole." This type of picture, old and familiar as it is, has, just because of its familiarity to all of us, a tremendously popular appeal. To get this picture, the proper setting must first be found. Next, the "props": old clothing borrowed from small friends, perhaps some overalls and a straw hat such as boys wear on the farm—unless it is a "town hole" and not a country hole. We choose a sunny afternoon, place the clothes on the bank (or "hang 'em on a hickory limb"), get the camera all set and properly focused on the water with the clothes on the bank in the foreground. A large rock thrown into the water the moment before the shutter is snapped provides the splash and widening ripples and completes the picture.



This combination of shoes, blueprints and a folding-rule, will attract almost everyone's eye because of the novelty and suggestiveness of the arrangement.



Without a human figure, this interesting advertising shot tells a very definite human interest story.

Still life photography lends itself remarkably well to human interest pictures without humans. A picture of a pot boiling over on the stove carries human interest. We are conscious of the presence of a human being even though she doesn't appear in the picture. An ax leaning against a freshly cut tree with bright, clean chips lying on the ground—a "T" square and triangle with pencil and compass on a drawing board—a burning cigarette on the edge of a plate—a slipper stuck in the mud—or just a footprint—all of these things carry human interest.

In preparing advertising illustrations we very often cannot for one reason or another, use people, yet human interest is essential. Experience has taught us that without it an illustration is pretty sure to be dull. Given human interest the illustration becomes effective, it becomes alive; it demands a second look and begins to do a real job of selling. So we put forth every effort to inject at least some measure of human interest into every illustration we use.

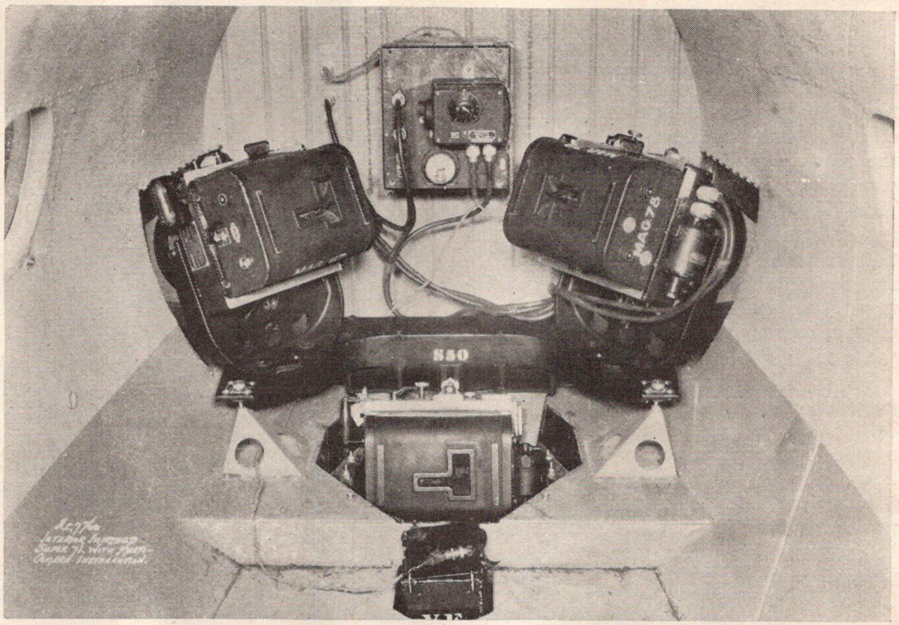
Here we have two shoe illustrations used in the Spring Florsheim Style Book. One shows a pair of smart brown shoes standing on a brick floor besides a flower pot. In the lower left hand corner is shown part of a seed catalog page. It

(*Continued on page* 69)

Mapping with an Aerial Camera

by FRANK FLAHERTY

A simple yet comprehensive account of the aerial photographic surveys made in Canada from airplanes. The cameras accomplish in hours what otherwise might take a surveying party many days or even weeks to accomplish.



Photos courtesy Royal Canadian Air Force.

Interior of a seaplane showing the installation of three cameras for oblique photography. The cameras point to the rear looking out under the tail of the plane. The televalometer is shown at the rear on the bulkhead while the wiring links the camera to the plane's power system.

ACROSS northern Canada the camera is blazing new trails of civilization and exploding old notions of the so-called barren lands. Harnessed to the airplane the camera is uncovering new and unsuspected mineral riches and opening up a vast storehouse of raw materials, which will one day play a role in the industrial life of North America.

Aerial photography is now the sole method used by Canadian government surveyors in exploring and mapping the unpeopled, untracked spaces of northern Canada. They have developed aerial photography to a high state of perfection and their success has attracted the interest of other governments, some of whom are interested in its prospects from a military as well as an economic point of view.

Picture a surveyor paddling his canoe along a northern stream or patiently plodding across country. At the most he can observe only a few hundred yards of territory at a time. Lift the same man up five or ten thousand feet in the air and his range of vision is immeasurably widened. Give him a camera and in the twinkling of an eye he can make a complete record of his observations, recording on the film data which could *not* be obtained in weary months of ground work.

That is how the camera combined with the airplane has revolutionized northern surveying. But its advantages do *not* stop with the surveyor who is primarily interested in drawing a map. The aerial photograph, back in civilization, has a different story to be read by the geologist interested in pure science, the geologist looking for minerals, the lumberman, the water engineer and the road builder.

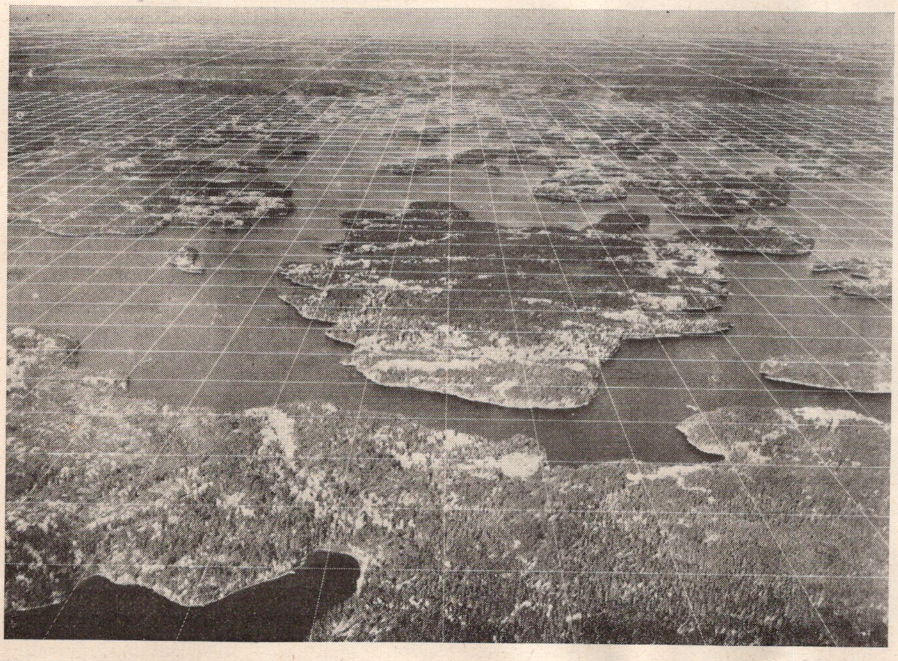
The geologist, sitting in his office, can spot significant rock formations, breaks and dikes on an aerial photograph. By a process of elimination he rules out of consideration areas which offer *no* promise and concentrates on likely spots for mineralization. When he finds a promising area in the photographs he can visit it for closer study from the air or on the ground.

A few years ago two capable geologists paddled along the shore of Great Bear Lake in the Northwest Territories and camped on the edge of a bay. There was nothing to suggest a journey inland at that point more than at another. A little later an aerial survey was made of the district and something in the photographs caught the eye of Gilbert Labine, an experienced prospector. He found a rich deposit of pitchblende from which radium, most valuable of all minerals is obtained. Gold and silver were also found and today there is a busy producing mine a few yards from the earlier lakeshore camp.

Timber resources can be estimated by a skilled appraiser from aerial photographs. Recently a shaggy old woodsman walked into the topographical survey office in Ottawa and inquired about a particular territory. He said he was the owner of certain timber limits and had a dispute over their value with a lumber company which wanted to buy them. He was prepared to take what they were worth but *"Not a damn cent less."*

Photographs of the territory were produced and after looking them over the lumber company's appraisers were glad to pay half as much again as the owner had asked in the first place. Both parties to the deal had underestimated the value of the timber until they saw the pictures.

When a promising mineral deposit is found two things are needed, a road over which to bring in machinery and supplies and water power to operate the machinery.



The first stage in mapping is the application of the grid of diminishing squares to the picture. The lines converge to the distant horizon in the manner of a perspective.

The aerial photographs are scanned again.

The shortest and easiest route for the road is mapped out from the photographs. Before the road builders set foot on the ground they know the number of bridges, culverts and cuttings needed, the grades, the road building material at hand. The cost has been estimated in advance. Similarly the photographs are used to locate the nearest suitable water fall or dam site and to plot the course of the transmission line.

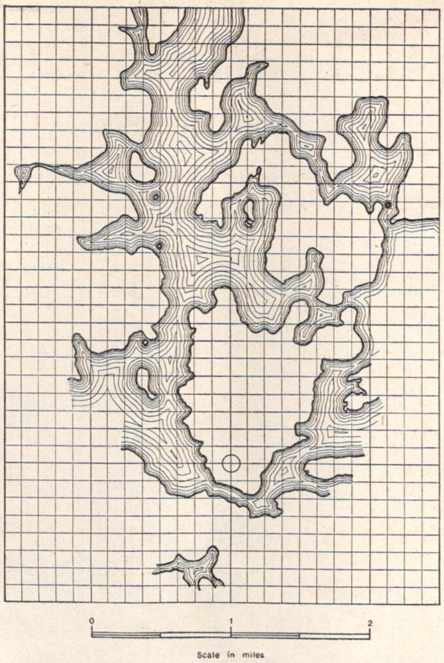
A glance at the map of Canada shows the wide field still open for aerial exploration. Along the southern border is a strip of settled country varying in width and to the north a vast expanse of unpopulated country extending to the Arctic Ocean. Most of this is unsuitable for farming and until the advent of aerial photography was the private preserve of Indians and Eskimaux with a few white men making a living by trapping and the fur trade. Little of the country had ever been seen by a white man.

Prior to 1922 when aerial photography came into use in Canadian surveying, some 240,000 square miles of territory had been mapped, most of it in the settled areas. Since then 481,000 square miles, almost all in remote areas has been mapped. The new maps show more than 3,500 lakes never before seen by white men. The aerial photographic library at survey headquarters now contains more than 700,000 views which form the bases for the new maps.

OBLIQUE AND VERTICAL PHOTOGRAPHY

It was the evolution of the oblique method of aerial photography which enabled Canadian surveyors to make such rapid progress in mapping. The usual and, from many points of view, the most effective method is the vertical but the oblique for certain types of country is satisfactory and much more economical.

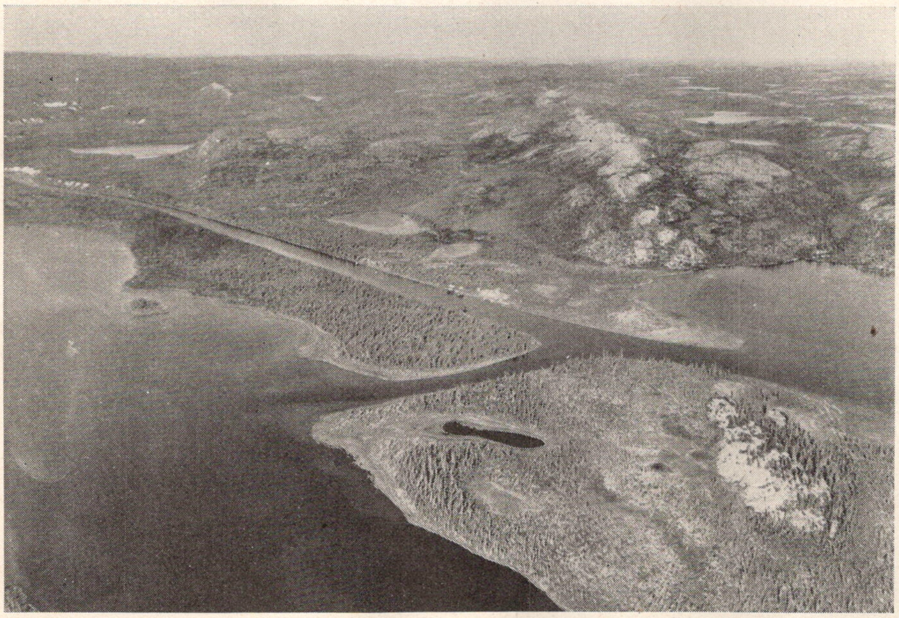
In the vertical method the camera is pointed straight down with the plane flying an even course. In oblique work the camera is pointed on an angle at the horizon. Thus an oblique picture takes in much more territory than a vertical one and presents distinctive problems for the interpreter or map-maker owing to the diminishing scale towards the background.



A skeleton plot or line-drawing, drawn to scale from the picture on the previous page. The grid enables the map-maker to draw the small-scale background and large scale foreground to a uniform scale. The azimuth line is marked with a circle.

Owing to the great expanse of territory to be mapped and the small amount of money available, the oblique method is used wherever possible. By it, far more country can be photographed than would be the case with the vertical method, with the same number of shots and flying.

The oblique method is suitable for comparatively level areas well supplied with water features. On such territory *no* hills or mountains come between the camera and sections of the earth's surface and the lakes and streams are a great help in identifying photographs and piecing them together prior to drawing the maps. Almost the whole of the north country lying between the Rocky Mountains and Hudson Bay is of the level type which lends itself to oblique photography.



The whitish ridge at the right is a quartz vein which may or may not carry gold. It marks the area as being worthy of investigation. A ground observer might not suspect this and if he did it would take him weeks to complete the investigation. The cross marks the optical center of the photograph.

For hilly or mountainous areas the vertical method is used. The camera reaches into valleys and around the hills. Pictures are taken in overlapping pairs and when read with the stereoscope elevations can be noted and contours drawn, something that is impossible with oblique pictures.

THE CAMERA AND THE OBLIQUE METHOD

The camera preferred is a Fairchild F3 although Fairchild K3's are also used. The instrument is really three cameras in one or a single camera with three lenses, three films and three shutters. Pictures in the oblique method are taken in simultaneous sets of three. The cameras are mounted in the body of the plane looking out to the rear under the tail.

One camera points directly to the rear along the line of flight. The other two point to the right and to the left in a fixed interangular relation. Their position is fixed so that when the plane is travelling on a level course the cameras have a 21 degree dip from the horizontal. This results in the pictures showing the horizon about 7/10 inches from the upper side of the pictures which are 7 by nine inches.

The camera operator has *no* worries about sighting his instrument. That is done by the pilot. The machines are equipped with the best available instruments to aid the pilot in keeping to a straight course and in keeping his plane on an even keel, avoiding a tilt either sidewise or from front to rear. As long as the plane is kept level the camera is in proper position.

The cameras are wholly automatic and are operated from the 12-volt electric power unit of the aircraft. An electric motor changes the films and operates the shutters. Shutters of the three cameras are released simultaneously every three minutes, which means a set of three oblique photographs every three miles along the line of flight.

The automatic shutter release is effected by an intervalometer attached to the camera which can be fixed to release the shutter at any desired interval.

Cameras are fitted with detachable magazines so that films can be changed in the air. Each magazine holds a spool of film 75 feet long by nine inches wide, enough for about 110 exposures or a photographic flight of 330 miles.

Supersensitive panchromatic film is used, usually with an aero 2 filter but sometimes with a minus blue filter. The haze which hangs over the earth's surface to a depth of 2,000 feet necessitates the filter. In taking oblique pictures this haze must be penetrated diagonally for a great distance but in vertical shots there is only the 2,000 feet to pierce and the filter problem is less acute. The haze reflects blue light and the filter takes out the blue.

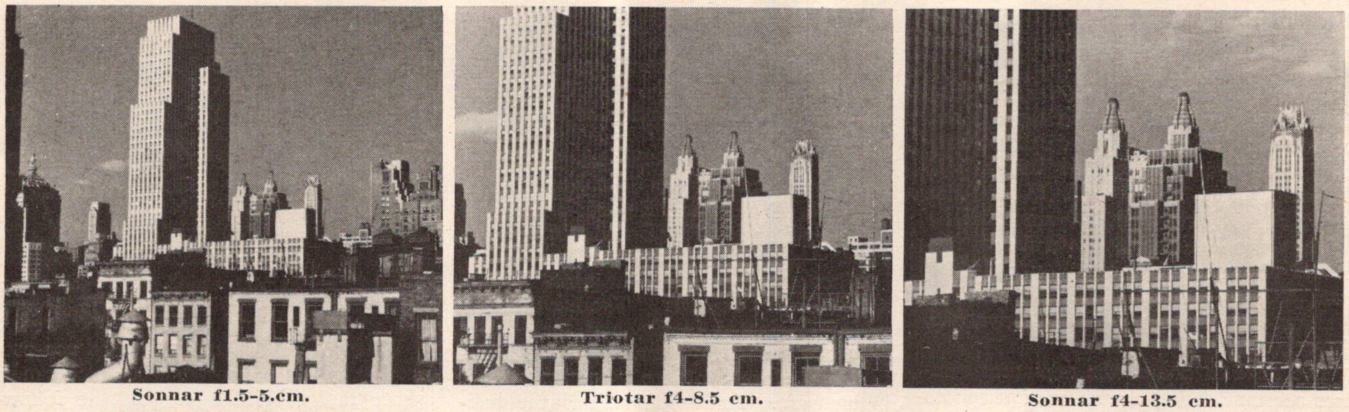
The film has a topographical base

(*Continued on page* 60)

Reaching Out with the Miniature

by JACOB DESCHIN

A detailed account of the special auxiliary telephoto lenses now being offered on the market for the various miniature cameras. Shooting distance with a telephoto lens is a great little sport but how it punishes the pocket book.



Sonnar f1.5-5.cm. Triotar f4-8.5 cm. Sonnar f4-13.5 cm.

Showing the effect of increasing the focal length in three successive stages with three telephoto lenses, reading from left to right. Taken with a Zeiss Ikon-Contax through an R-10 light red filter. Exposure 1/2 sec., f11, Edwal 12, Agfa Finopan, Velour Black in D-52 by William H. Field.

YOU cannot get too close for a portrait, they say, without courting some distortion in the resulting print, nor can you get too close for an animal picture without chasing it away or, perhaps, the other way about.

So you heed the rules in the first place and follow discretion in the second, and what do you get? Negatives in which a great deal of unwanted matter is unavoidably included and which must be subjected to reasonable enlargement in order to rescue the tiny treasure you aimed at.

This means, despite the wonderful grainlessness claimed for the ultra ultra fine-grain developers used in the processing of miniature-type film, that your picture lacks most of the things you would like to find in it.

Now, provided your camera is designed to take different lenses as desired, suppose you remove the lens and insert in its place a lens having a longer focal length, say a 4-inch lens instead of the 2-inch lens you normally employ.

To see the new result you will have to use either a masking device or so-called universal view-finder adjusted to the focal length of the new lens or, better still, a ground-glass back, if you have this valuable attachment.

Your first experience with one of these longer lenses will probably make your heart skip a beat. Why, you will exclaim, it is just as if you had actually brought your camera closer to the subject, although you have done nothing more complicated than substituting one lens for another.

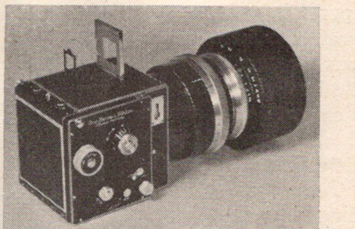
Marvelous, isn't it? Not at all, says the expert; it is simply a law of optics. So it is, but it is marvelous, none the less, and don't let him dampen your first thrill in getting a large "close-up" image where your other lens gave you a small one.

However, to get things clear, (and why should knowledge dull enthusiasm?) let the expert have his say. Your normal 2-inch lens gives you a 48° angle of view; the 4-inch one cuts this down to only 27°. How does this happen?

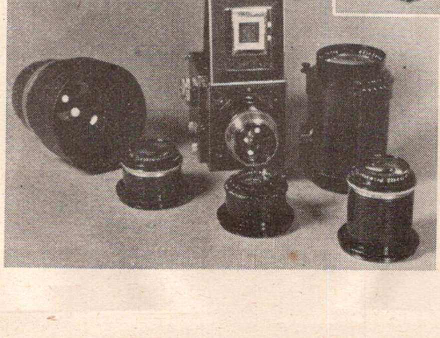
It happens because a law of optics says that the longer the focal length of the lens for a given size film the smaller is the angle of view covered by the lens and, for this reason, the larger the image that appears on the film. The focal length of a lens, as you may know, is the distance from the optical center of the lens to the sensitized film when the lens has been focused on a distant object, that is, infinity.

Well, that's one way of putting it. But here's another, not quite so scientific, but maybe clearer to some. Take one of the black sheets of paper that are used to protect cut film in packing, or any black or dark piece of paper or cardboard.

Cut an opening in the center about 1 by 1½ inches or 1 inch square. Pick out a possible photographic subject, say the fireplace with a vase or decorative plate on the mantelpiece. Stand off a respectable distance and look at your subject through the opening in the paper or card. Start off by holding the card pretty close to your eyes. This will permit you to see quite a bit.



RIGHT. An Astro Oan Tachar lens, f1.8-12.5 cm., attached to a Primarflex.



BELOW. The Primarflex shown, with its complete equipment of five attachable telephoto lenses of varying focal length.

Now move the card forward an inch; you see less. As you continue to move the card forward you will see graphically illustrated the principle of the effect of a long focus lens on the size of the image appearing on the film.

If you have moved the card forward enough, you will find eventually that you can see only the vase or dish on the mantelpiece and it may be, if you were actually taking a picture, that this is all you would want.

Now, here is where the miniature camera has it all over the larger one. The telephoto lenses available to it weigh much less, therefore permitting their being carried about without great inconvenience, ready to be quickly interchanged with the normal lens while strolling along and, if you can afford the price, two or more can be easily accommodated in the pockets of one's coat or in a convenient case. Thus, you can carry an entire "studio" of equipment along ready for a variety of shooting opportunities, whether taken from near view-points or far.

Owing to certain optical requirements and to such a factor as excessive weight, most telephoto lenses are of relatively slow speed as compared with the fast lenses normally associated with the miniature cameras, but are generally fast enough for the type of subjects usually attempted with the telephoto.

There are several, however, which though not strictly telephoto are long-focus lenses capable of giving large images, that are as fast as the normal lenses. Among these first place must be given to the Sonnar f2 lens of 85-mm focal length that is available to the Contax ($215); the 73-mm Hektor f1.9 ($198) available to the Leica and the 90-mm Thambar f2.2 soft focus lens ($150) sold for the Leica for use in portraiture.

In the truly telephoto class the fastest lens is the Sonnar f2.8 of 180-mm focal length and selling for $450. This is probably a lot more money than many can spend merely for a lens, but for certain operators, like naturalists and scientists, it is doubtless of incalculable value.

Other Contax telephoto lenses, including their speed, distance-reaching capacity and price follow: Triotar, f4, 85-mm, $85; Sonnar, f4, 135-mm, $108; Tele-Tessar, f6.3, 180-mm, $174; Tele-Tessar, f8, 300-mm, $336; Far-Objective, f8, 500-mm, $462.

The Leica line, besides those already discussed above, includes the Elmar, f4, 90-mm, $83.50; Elmar, f6.3, 105-mm, $69; Hektor, f4.5, 135-mm, $126, and Telyt, f4.5, 200-mm, $144.

The third in line of the miniature cameras accommodating a variety of telephoto lenses is the reflex-type Exakta. This camera is provided with a number of telephoto lenses, one of which, the Ihagee f4.5 of 11 cm. focal length, is most commonly used. This lens, which is quite fast is reasonably priced at $33.

The Exakta, as is generally known, uses the full vest pocket size film. The other lenses are the Tele-Tessar, f6.3, 13-cm, $105; Tele-Tessar, f6.3, 18-cm, $155; Tele-Tessar, f6.3, 25-cm, $192.50, and the Tele Megor, f5.5, 15-cm, $78. The focal length of the lens normally supplied for the Exakta is 7 or 7.5 cm.

A fourth miniature, taking 2¼ by 3¼ film, is the Plaubel Makina, whose normal lens is 4 inches and for which a telephoto called the Tele-Makinar is available with a speed of f6.3, a focal length of 8¼ inches and a price of $70.

The Makina is not heard about as much as it might be, though a good many excellent workers think very highly of it, particularly because of its versatility. A complete outfit is equipped with three lenses, the 4 inch Anticomar f2.9, the 2⅞ inch wide-angle lens and the telephoto lens, as well as various accessory units, containing everything necessary for photographing anything from a close-up of a bee to a "head-and-shoulder" portrait.

Another miniature reflex camera which takes a telephoto lens is the National Graflex Series II, little brother of the famous line of Graflex cameras with which everyone is familiar. It gives 2¼x2½-inch negatives with the regular 75-mm (3-inch), f3.5 B. & L. Tessar, a larger or "closer-up" image being provided by the 140-mm f6.3 B. & L. telephoto selling for $55.

The newest addition to the list of cameras offering the advantage of interchangeable lenses is the Primarflex, a reflex camera giving a picture 2¼ by 2¼ inches and convertible from the rollfilm to the plate back type without extra equipment. It is distributed in the United States by the Mimosa American Corporation, 485 Fifth

(*Concluded on page 63*)

Tips from a Candid-Cameraman

An Interview with M. Robert Rogers

by Rosa Reilly

KNOWN to photographers and non-professionals alike as one of the youngest and cleverest candid camera men in New York, M. Robert Rogers needs little introduction. His uncanny knack for catching spontaneous poses of famous men and women which have been reproduced in many magazines for the past three years has won him the admiration of the picture world.

It is no coincidence that at the age of twenty-five, and only a few years out of Harvard, Cameraman Rogers is assistant picture editor for TIME and LIFE magazines.

When asked to define the term, "candid shot," Rogers replied: "The candid shot, which originated in England some years ago, has come to mean a photograph—usually a close-up, taken when the subject is unaware. And should show the individual in a clear and vital pose.

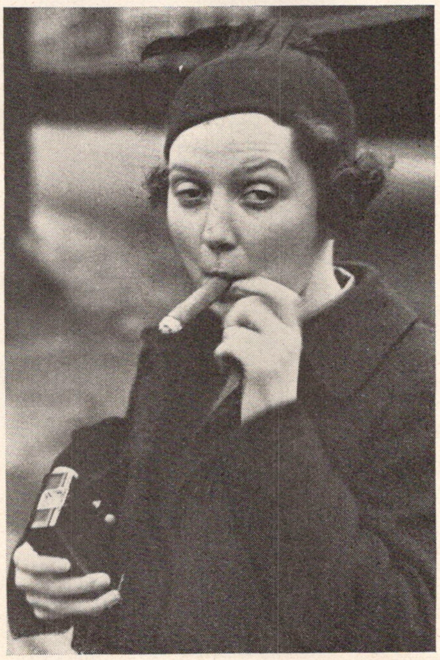
"It need not be humorous," he continued. "In fact it is frequently tragic.

"The miniature camera is ideal for such shots because it is unobtrusive. However, some photographers get successful results with larger equipment."

As an example of Rogers' work, we spotted a candid shot of a lady smoking a cigar. "Nicotine Fiend" is the title given the shot (note accompanying illustration.)

Nicotine Fiend was shot with a Leica equipped with a Summar lens. It was taken late one winter afternoon at f3.2 and 1/60 second. The film used was Eastman Super-X. The type of developer is Rogers' own formula which he did not disclose.

The print was made on Velour Black D.L., was developed in Eastman D72 and is an enlargement only of a section of the miniature negative.



NICOTINE FIEND, shot with a Leica by candid-cameraman Rogers, is one of his favorites.

A rare candid picture of Max Schmeling, taken by Max Haas with a Leica at f3.2, ¼ second with Leica superfilm.

When asked to give advice to non-professionals on how to duplicate such candid photography, Mr. Rogers had the following concise suggestions to offer:

"There is a standard practice," he commented, "which may be safely used by amateurs. But let me say a word here. The Leica is simple to operate but it is also a complex piece of mechanism. One should not try to use it 'cold.'

"A mechanism for which you pay two hundred and fifty-five dollars is bound to require special care. It's the same with some automobiles. You can step into them and drive them off. But if you buy a Mercedes-Benz, you have to know how to look after it or it won't work.

"The non-professional photographer should start by utilizing either a medium speed panchromatic film or better yet, an orthochromatic film.

"It would be well for the inexperienced operator to confine himself to daylight shots at first. If he wants to be sure of getting a picture in brilliant sunshine with the film material previously mentioned, he should be able to take it at f6.3—at one one-hundredth of a second.

"For the non-professional," Mr. Rogers went on, "I should strongly advise the use of an electric exposure meter. A Weston may be procured for $22.50. Other meters range down to a few dollars.

"In my opinion it would also be advisable for an amateur to consider the purchase of an inexpensive camera—such as an Argus, for instance, to practice on before he invests in an expensive miniature instrument."

Because of his editorial responsibility on TIME and LIFE where he assists in the selection of photographs for both publications, Mr. Rogers has little opportunity for actual photography. When he is free to work at it, he confines himself exclusively to press photographs from the candid viewpoint.

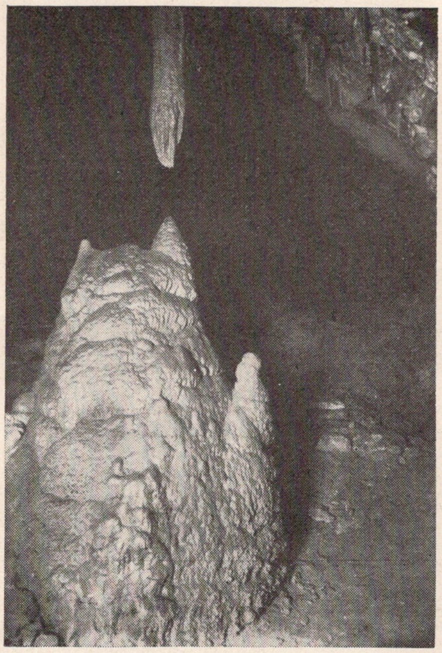
Next month Cameraman Rogers will write an article for us, entitled "Snapping the Maestros in the Music Halls"—which will tell how he has photographed famous conductors of symphony orchestras during concerts.

How to Take Cave Pictures

by

RUSSELL TRALL NEVILLE

A famed cave explorer and photographer presents some sound advice and words of warning to the adventuresome amateur.



Fifteen feet high, this formation is estimated to be 10,000,000 years old. Data: Eastman view box camera, 5x7, Cooke lens f 5.6, stopped to f 16. One-half ounce Victor soft grade flash powder used, shot in a Victor gun. Gevaert Express Pan film, tank developed.

CAVE photography is one of the most difficult branches of camera art. Added to the technical difficulties (a total absence of all natural light), are the dangers and hazards involved getting to the place where you expect to make your picture.

A friend of mine who is very familiar with some of my cave photographs went with me a year or so ago to a cave where I had worked the previous year. He had an enlarged picture taken in this cave hanging on his office walls. Finally we reached the particular place I had in mind.

"Doc, do you recognize this place?" I asked.

He looked at it from all angles and finally admitted that he didn't see anything familiar about it. "You should," I told him, "because you have a photograph of this formation taken from this point, hanging in your office."

Doc looked around again very carefully and then dryly remarked, "All I've got to say is this, you made a hell of a pretty picture of a pile of dirty rocks."

There is no other camera work where it is so important to possess the faculty of being able to "see" a photograph before it is taken. In landscape work you can very often arrange to take your picture when light conditions are at their best or favor the result you hope to achieve. You have considerable latitude as to the point from which to work. In a cave you furnish your own light, it is true, but you must get your results from one powerful source of concentrated light, without any diffusion whatsoever.

Very often, in caves, you are compelled to work in crowded spaces making it impossible to choose your spot for the camera. You simply have to take your cave formations and scenes as you find them, it being an obvious fact that you cannot shift them around or re-arrange them.

In genre work you place your lights and your subject to suit your requirements. So, you will realize there are tremendous handicaps in cave photography not encountered in other work.

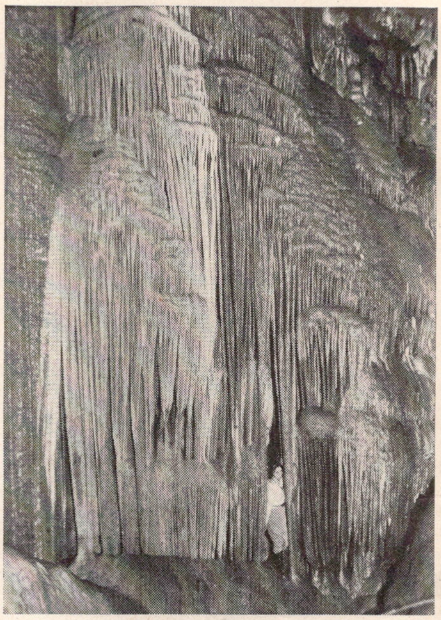
Added to the ordinary hazards involving original cave exploration work is that of handling flash powder. I use a soft grade of powder, the slow burning sort which does not explode. A concussion in a cave may be dangerous on account of the danger of dislodging loose rocks, blocking your way out. Always remember that flash powder is a *dangerous explosive* and treat it with all of the courtesy and loving care you would bestow upon an equal quantity of TNT or nitro-glycerine.

Still something else to contend with in cave photography is the gas and smoke from flash powder. You simply cannot make a photograph where there is the slightest trace of this smoke. You may not be able to see it, but if you can even smell it, you may as well pass along and not waste films because you won't get any picture if you try to take one through this fog, invisible though it may seem.

This smoke proposition is dangerous, too. You have to watch out for it or you may wake up finding them patting the ground in your face. Asphyxiation is an even present danger in cave photography, especially if you use flares as we do for movie making. There is generally a very good circulation of air in caverns, which helps a lot.

The first thing we do when we go into a cave is to determine the direction of the air currents. If the air is coming into the cave, we start our picture making at the furthest point in the cave and work towards the entrance. If the air is blowing out of the cave, we start just inside and work back towards the end. That helps keep the smoke out of your way.

I am often asked why I do not use bulbs. There are many reasons, but one or two vital ones are sufficient to explain why I still stick to flash powder, dangerous though it is.



A gigantic cave in the Ozarks. Data: ¾ oz. powder used; lens f 12; Wollensak Extreme Wide Angle lens. Otherwise, same as in picture shown in Col. 1.

In the first place, bulbs are not powerful enough to give me the light I must have. In the second place, they are too bulky and fragile. If you crawl along on your hands and knees or on your belly dragging a camera equipment along with you, or squeeze through tight passageways, you want to reduce your bulk and load to the minimum.

You cannot carry anything very fragile, bumping along over the rocks. It's all I can do to protect my precious camera and lens equipment under these conditions and I don't want to burden any of my party with a bulky, fragile package of bulbs. The expense of bulbs is also an item to be taken into consideration. I have used as much as a pound of flash powder on one trip into a cave. Figure out the comparative expense and bulk on that.

Don't misunderstand me. I use bulbs in other work and like them. I'm not prejudiced against them at all,—I just find from experience that they are not suited to my work in caves.

I use an Eastman 5x7 view box camera. I like that size and I like a plain, sturdy camera with only the necessary swing adjustments,—one without frills or fuss. A stout, light, tripod is a necessity, of course. I use a very large focusing cloth which I wrap around my camera to protect it from dirt and water. Sometimes it is necessary to wrap the camera in a piece of oilcloth also.

My lens equipment is simple. I use a Wollensak Extreme Wide Angle lens, 110 degrees, f12. and find this very desirable. Many of my 5000 cave negatives have been taken with a Cooke f5.6 lens.

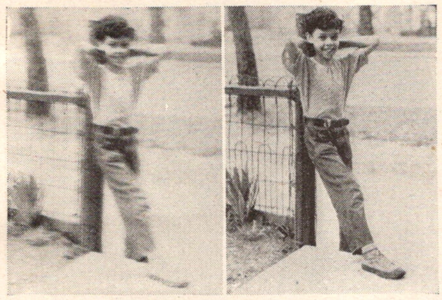
I stop all lenses to f16. in cave work, thereby making it easier to calculate the amount of powder required. A rough rule is to use one heaping teaspoonful of powder for every 12 feet of distance. A lot depends on reflecting surfaces, size of

(*Continued on page 63*)

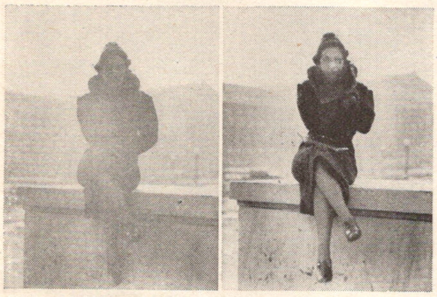
Right and Wrong Methods

by W. F. KELLEY

A monthly lesson in what to do and what to avoid in amateur photography.



Camera Moved **Camera Still**
Shutter should be set at 1/25 sec. or faster when held in the hand.



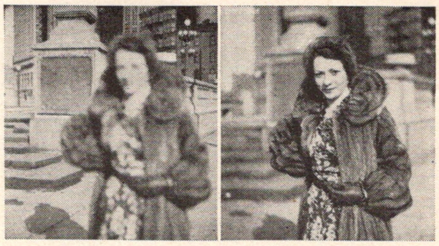
Sun Strikes Lens **Lens Shaded**
You cannot face the sun without a lens shade of proper type.

EACH month POPULAR PHOTOGRAPHY will pass on to its readers a few tips for the benefit of beginners. We start off with some very elementary examples of snapshot difficulties, but as we progress we will reach some of the more complicated problems that stump even the more advanced amateurs.

An important rule is DON'T MOVE YOUR CAMERA. Even the slightest motion of your camera, particularly on shots taken at anything less than 1/50 (fixed-focus box cameras are normally set at 1/25), will blur the picture so that it is unrecognizable. Support the camera against your body. Press the lever with a trigger-finger action, not arm action. It helps to hold your breath—but don't hold it on long exposures, use a tripod.

The sun or light can come from any direction, but it should not shine directly into the lens of the camera. It is only possible to shoot toward the sun when the lens is carefully shielded with a lens hood. If light strikes the lens the resultant picture will be lightstruck in appearance, fogged and hazy.

Be sure that your primary subject matter is in focus. Focusing is simple where a ground glass is used (Graflex), or with a built-in range-finder (Leica). On others the photographer must measure his distance and correctly set the distance scale on the camera.



Out of Focus **In Focus**
Proper focusing is the first step.

This is a "double exposure" with two pictures on one film. Be sure to shift the film after each exposure.

Don't forget to turn the film after each exposure. It is a good idea to do this immediately after the picture is taken and should be considered part of the operation of making the exposure. Double exposures may give some very amusing effects, but are a sign of very careless photography.

A List of Current Exhibitions

SALON	ADDRESS	ENTRY FEE	ENTRIES ALLOWED	CLOSING DATE	DATES OPEN TO PUBLIC
Fourth Annual Canadian Salon of Photography	66 King St., E. Hamilton, Ont., Canada	$1.00	6		April 19-May 3
38th Annual Photographic Salon of Portland Society of Art	111 High Street Portland, Maine				April 11-May 9
22nd Annual Exhibition of Pictorial Photography of Hammersmith Hampshire House Photographic Society	Hampshire Hog Lane Hampshire London, W. 6, England				April 9-April 19
Fifth Annual Princeton Photographic Exhibition	Princeton, New Jersey		4		April 5-April 17
New Zealand International Photographic Salon	P. O. Box 91 Hamilton Waikato, New Zealand		12		May 11-May 15
Third Annual Open Exhibition of Photography of Bristol Photographic Society	50a Belvoir Road St. Andrew's Park Bristol, 6, England				May 1-May 29
Fourth International Milwaukee Salon	Milwaukee Art Institute Milwaukee, Wisconsin		4	April 7	May 1-May 17
Third Annual Blossom Festival Salon of Photography	614 Broad St. St. Joseph, Michigan	None		April 20	May 9-May 16
Western Counties Salon of Photography	The Art Gallery Plymouth, Devon, Eng.	1s per print		May 8	June 5-June 19
Northern Photographic Exhibition	Cartwright Memorial Hall Bradford, Yorks, England	4s		May 22	June 19-August 21
8th Chicago International Salon of Photography	Chicago Camera Club 137 N. Wabash, Chicago, Ill.	$1.00		June 10	July 15-Sept. 19
1st Annual National Photographic Salon for Women	Min. Cam. Club of Phila. 1501 Walnut St. Philadelphia, Pa.	$1.00	6		May

An Ideal File for Negatives

by F. DALE SMITH

Have trouble in finding your pet negatives? Well, here is a fine file and filing system that solves your problem at low cost.

HOW would you like to have an ideal filing case for your negatives?

Such a case would be a neatly enameled, long steel box just a little wider than the negatives. It would be dustproof when closed, with its hinged lid secured with lock and, if desired, a key. The inside would have an adjustable slanting support for the negatives, separators, and index tabs.

A search for such a complete case in each of the popular sizes of negatives would prove futile. However, one need not deny himself such a case just because they are not listed in assorted sizes in the photographic catalogs, or because of possible high costs. This article tells in detail how you can easily make the adjustable slanting support.

A low-priced neat steel box, just a little wider than your negatives can be selected from the assorted sizes available in the tool and fishing tackle departments of the dime to dollar stores or listed by the mail-order houses.

Fig. 1 shows three sizes of such cases in use. The smallest one is a fishing tackle case which costs ten cents and is suitable for all miniature negatives 2¼ x 2¼ and smaller. The middle-sized box costs only twenty cents and takes the popular 2¼ x 3¼, 2½ x 4¼, or 3¼ x 4¼ sizes.

The larger case was a tool box costing around fifty cents; a small tray built inside was removed (this makes a handy addition to the front of any desk drawer) and can be used for postcard size (3¼ x 5½), or 4 x 5 negatives. Steel cash boxes are also quite suitable but are a little more expensive.

An especially nice feature of all these boxes is that they have either built-in locks or provisions for a small padlock. This insures that the negatives can be handled only by yourself and are also kept free from dust.

Fig. 2 shows the novel adjustable follower support in use. It can be moved easily by grasping the two ears in the back and pinching them together and will stay securely wherever released.

The support is made from any thin sheet metal such as aluminum or tin and bent over a block in a vice to two right angles to the dimensions shown. The remaining slant can be put in by hand.

The best thing to do next is to find a suitable compression spring that can be closed partly with the fingers. After it is selected get a round stick or metal rod that will fit loosely in the center of the spring.

Then make the two blocks as shown to fit loosely in the support and drill through it an oversize hole for the rod. The two angle brackets at the top are added for easy manipulation. The spring will press the blocks against the sides of the box and the friction will hold the follower wherever put.

No filing case will be of much use unless it is indexed with a handy system. The first thing to do is to provide a paper spacer between each negative to prevent scratches. This spacer can have the negative number written in each left hand corner and have an index tab about every ten negatives.

If you happen to use mostly cut films the black paper between the new negatives makes ideal spacers and the cardboards make good stiff supports for the protruding index, or you can cut them a little larger than your negative from any light paper.

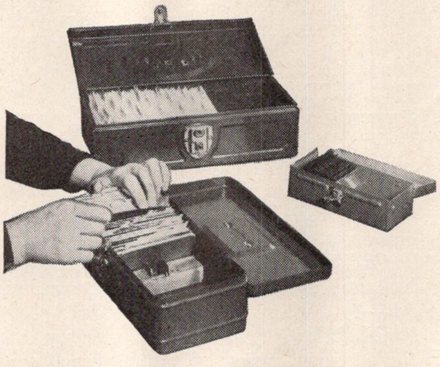


Fig. 1. Steel boxes come in three standard sizes, as shown above.

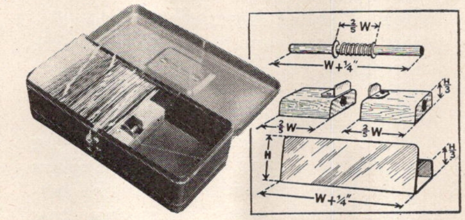


Fig. 2. The adjustable follower fits snugly against the negatives. In the diagram W=width of negatives; H=height of the negatives.

The type of filing system to use depends quite a bit on the use one expects to make of his negatives. For the person who makes pictures only for his own pleasure and mounts all the good ones in an album, the simplest way is to number each page in the album and give this the same index number in the file. Then each negative on a certain page will be behind that number with spacers between.

For the more serious worker who wants to classify his negatives, the following system has proved to be one of the best as it has a minimum of negative handling and yet provides for an unlimited number of classifications and cross-indexing.

Complete exposure and data notes are made of each picture as they are taken. After the negatives are developed the ones to be kept are given the next serial number and all data entered in a special notebook kept for this purpose.

A detailed record of each exposure is invaluable for future reference and is one of the best ways to master the problems of correct exposure. Even those who use the electric meter can improve their work by such a record.

The more you use an exposure record, the less you'll need it, yet you will appreciate it more.

Those who do their own finishing will also find it handy to add columns in this notebook where they can keep the contact printing time, the grade of paper used and also the time for enlarging to their most common size. With this printing data opposite the original exposure data, a very definite correlation will soon be noticed and properly interpreted with all the exposure factors involved will make it much easier to get the desired density when making new negatives.

This serial number (also the title and date if the negative is large enough) is printed with India ink on the transparent edge of the glossy side of the negative and filed according to serial number.

Another classification book should also be kept. The names and number of classifications will vary greatly with the individual. A page in the book should be given to each classification desired which should be indexed at the front.

Periodically, say once a month, every new negative number, title, and date from the serial number book should be entered in the classification book and cross-indexed as many times as suitable. The negative always keeps the original serial number which enables it to be easily found and thus negative handling is kept at a minimum and all juggling as to classifications is done on paper only.

If you use more than one size of negative and desire to file each in a case of the most efficient size as shown in the illustrations, a letter before the serial number will always identify the size; for example in the illustrations the largest filing case contains only "G" (Graphic) negatives, the middle-sized one, "K" (Kodak) and the smallest "M" (Miniature).

A negative file is invaluable when the occasion arises to make extra prints from negatives taken some time back. Perhaps the print is lost; perhaps the subject has passed away. In any case, the original negative can be retrieved from the file in a moment and more than justifies the effort spent in keeping the file in good order.

Many variations and extensions of this system can be worked out and should work well with the ideal filing cases just described. Those who keep a card index record of their picture submissions and the like may prefer one of these handy lock-boxes with the adjustable follower for their personal records to an ordinary drawer-type index file.

END

Human Eye vs. Camera Eye

The camera lens serves a similar purpose as the human eye—only not so flexible.

AS WILL be seen from the accompanying photograph, the camera lens is in many ways directly comparable to the human eye and performs many of the same functions.

For example, the lens of the eye serves the same purpose in converging the light rays as the lens in the camera, an inverted image being formed on the retina or rear wall of the eyeball in the same way that the image is formed on the face of the film or focusing ground-glass of the camera. Sharp focusing is attained in the eye by compressing the eyeball in essentially the same way as the bellows of a camera is extended and compressed.

The shutter used in opening and closing the camera lens corresponds to the eyelids. The iris diaphragm in the camera lens is employed for increasing or decreasing the lens opening in the same way that the iris of the eye controls the amount of admitted light.

The similarity between the eye and camera lens is further proved by the many experiments in which actual photographs were taken with the eyeballs freshly removed from dead sheep and cattle.

Second Rolleiflex Salon

MAY 7 is the closing date for this salon for pictures made with a Rolleiflex, Rolleicord, Heidoscope, or Rolleidoscope. Full data as to film, exposure, and paper used must be plainly shown on the back of each print. Entries are limited to 4 prints for one person; no prints smaller than 8 x 8 inches will be considered. In submitting to this salon, as well as most others, it is preferred that prints be mounted on 16 x 20 mounts. Only white or light cream colored mounts may be used.

Four classes of prints will be judged: portrait, pictorial, technical, news. Cash prizes will be awarded in each class as follows: First prize, $50; second prize, $25. 25 honorable mention certificates will also be awarded in each class. A grand prize of $100 will be awarded to one of the 4 first prize winners. The jury will consist of Colonel Edward Steichen, Dr. F. M. Agha, Thomas J. Maloney.

Address your entries to the American distributors of these cameras, Burleigh Brooks, 127 W. 42nd Street, New York City.

A Glossary for Photography

ABAXIAL. A light ray that does not coincide with the optical axis, such as the marginal ray passing through a lens.

ABERRATION. Errors in the performance of a lens or mirror which cause defects in the pictures or distortion of the light rays passing through a lens. The most common aberrations encountered with a lens are: chromatic, spherical, coma and astigmatism.

ABRASION MARKS. Streaks and blotches occurring on bromide developing papers that appear much like pencil marks or scratches. They are probably due to the condition of the developer or the type of developer. They can be removed by rubbing them with a bit of cotton moistened in alcohol.

ABSOLUTE. Pure. Basic. Elemental.

ABSOLUTE ALCOHOL. Pure ethyl alcohol free from water.

ABSOLUTE TEMPERATURE. The temperature of a body measured from absolute zero or at the point where heat ceases to exist. This occurs at 460° F. below the zero of the Fahrenheit scale or 273° C. below the zero of the centigrade scale.

ABSOLUTE ZERO. The point at which heat and chemical action cease to exist. At —460° F. or —273° C.

ABSORPTION (Fluid). By reason of the surface tension of a fluid (capillary attraction), many bodies of an open structure draw in and retain fluids in the open pore spaces. This retention is known as "Fluid Absorption" and is displayed by such materials as charcoal, fabrics, sponges, etc.

ABSORPTION (Light). Light rays are said to be "absorbed" when they are destroyed or stopped before passing through glass or similar materials. Rays are also absorbed or stopped at the surfaces of solid opaque substances, this being known as "absorption by reflection."

ABSORPTION (Selective). Some bodies are transparent to certain colored rays, allowing them to pass, while stopping and absorbing rays of different color. By the choice of a material, we can select any desired color transmission. In practice this is known as FILTRATION.

A.C. Abbreviation for ALTERNATING CURRENT.

ACCELERATOR. Any substance, usually alkaline, which increases the activity of a DEVELOPER and shortens the time of development or the time in which the image appears. Examples: sodium carbonate, ammonia, potassium carbonate, sodium hydrate and potassium hydrate.

ACCELERATOR CONTROL. By varying the proportions of an accelerator in a developer, the time of development and the highlight details can be controlled. With over-exposed highlights, much detail can be brought out by reducing the amount of accelerator and prolonging the time of development.

ACETATES. Salts formed by the action of ACETIC ACID on metals or basic substances.

ACETIC ACID. An acid formed by oxidizing alcohol or by distilling wood at high temperatures. It predominates in vinegar and is marketed in three commercial grades: Glacial (99%) strong commercial and chemically pure. 28% (made by adding 3 oz. of Glacial to 8 oz. of water) is commonly used in photographic formulas.

ACETIC ACID (Glacial). Very pure acetic acid, 99% acid and 1% water, which solidifies into a mass of crystals at and below 34° F. It mixes with water and alcohol in all proportions. POISONOUS and quickly burns the skin.

ACETIC SHORT-STOP. A 5% solution of 28% acetic acid in water, used for quickly stopping the development and clearing the high-lights of bromide and other developing type papers. The paper is taken from the developer and immersed in the short-stop before placing in the fixing bath.

ACETONE. A volatile aromatic liquid frequently used as a solvent and known familiarly as "banana oil." It can also be used as a substitute for alkalis in a developer. It dissolves celluloid readily and is used in film cements for repairing and joining movie films. It is also used as a solvent for cellulose lacquers and other resinous varnishes.

ACETONE SULPHITE. A compound formed by mixing acetone and acid sodium sulphite. Used in some developer formulae as a substitute for sodium sulphite or potassium metabisulphite.

ACETYLENE. A combustible gas with a powerful odor of garlic, occasionally used in movie or still projectors where electric light is not available. Mixed with a stream of oxygen is used for cutting and welding metals.

ACHROMATIC. Without color or non-color producing.

ACHROMATIC COUPLE. A pair of transparent bodies so arranged that light transmitted through them successively does not cause a color fringe.

ACHROMATIC CELL. See ACHROMATIC LENS.

ACHROMATIC LENS. A lens that is free from chromatic aberration, or a lens that transmits and refracts white light without breaking it up into the spectrum or colored fringes. This result is obtained by cementing two lenses of flint glass and crown glass respectively, so that the differences in refractive value will correct color distortion. The combination generally used is a convex crown glass lens with a concave flint glass lens. The couple can also be formed by enclosing a flint MENISCUS LENS between two concavo-convex crown glass lenses.

ACID. A substance containing hydrogen and capable of combining with metals, during which combination, the hydrogen is displaced by the metal. Examples are: Sulphuric acid, hydrochloric acid, acetic acid, nitric acid, etc.

(*Continued on page* 59)

Building a Portable Enlarger

by C. L. BRISTOL

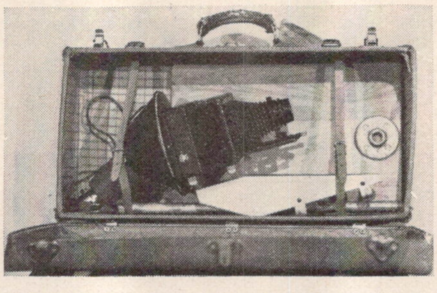
A very handy enlarger that can be moved around or carried with you. Ideal for limited space or vacation use.

INCREASED knowledge and enjoyment of his camera is attained by the amateur who makes his own enlargements. An inexpensive projector, which may be packed in an ordinary grip when not in use, places the enlarging art within reach of all photographers who are obliged to work in temporary or close quarters.

Drawings and photos accompanying this article show the portable enlarger in its simplest practical form. Materials used are an old view camera in combination with sundry items from the hardware store and electric shop, a total purchase of a very few dollars. All dimensions that may safely apply to any camera of this type are given on the drawings, and other phases of construction are shown in detail so that the builder may adapt the various parts to the particular camera he selects.

In choosing the camera, the builder should be guided by the maximum size of negatives he intends to enlarge. A four by five inch or post card size is ideal in most cases.

If a sharp focus can be had at a distance of twelve or fifteen inches, it will not be necessary to rebuild the focusing bed as shown in the drawing.



This is the enlarger described in the article. Note how compactly it fits into an ordinary suitcase.

Any "view-box" of standard type, however, can be converted by fitting it with an auxiliary lens board and employing the rising front as a micrometer focusing device. Approximate setting is obtained by a section of brass extension rod and tube, known commercially as a casement adjuster and found wherever builders hardware is sold. The exact type of adjuster will depend upon the style of camera.

Flat cameras, or those having insufficient bellows extension for close work, may be adapted by increasing the length of the box or body as shown in the photographs.

A satisfactory negative holder can be made from either the focusing back or plate holder by removing the back of either one and fitting it with two pieces of clear picture glass. It is desirable to hinge one or both fasteners to facilitate easy changing of negatives. A small screw, placed in the exposed end of the negative carrier thus formed, makes handling easier.

The lamp housing, of unusual compactness, is built by fitting a three-eighths inch plywood disk carefully into an ordinary outdoor type light shade. The shade selected must be of sufficient diameter to cover the back of the camera easily. An aperture, slightly greater than that of the negative holder, is sawed in the plywood disk which replaces the back of the camera. Holes are located for screwing this disk solidly to the camera at points where the screws do not interfere with free operation of the negative frame.

Heavy plate glass is used as a light diffusing agent and should be a quarter of an inch larger, all around, than the aperture it covers. This glass should be ground

(*Concluded on page 69*)

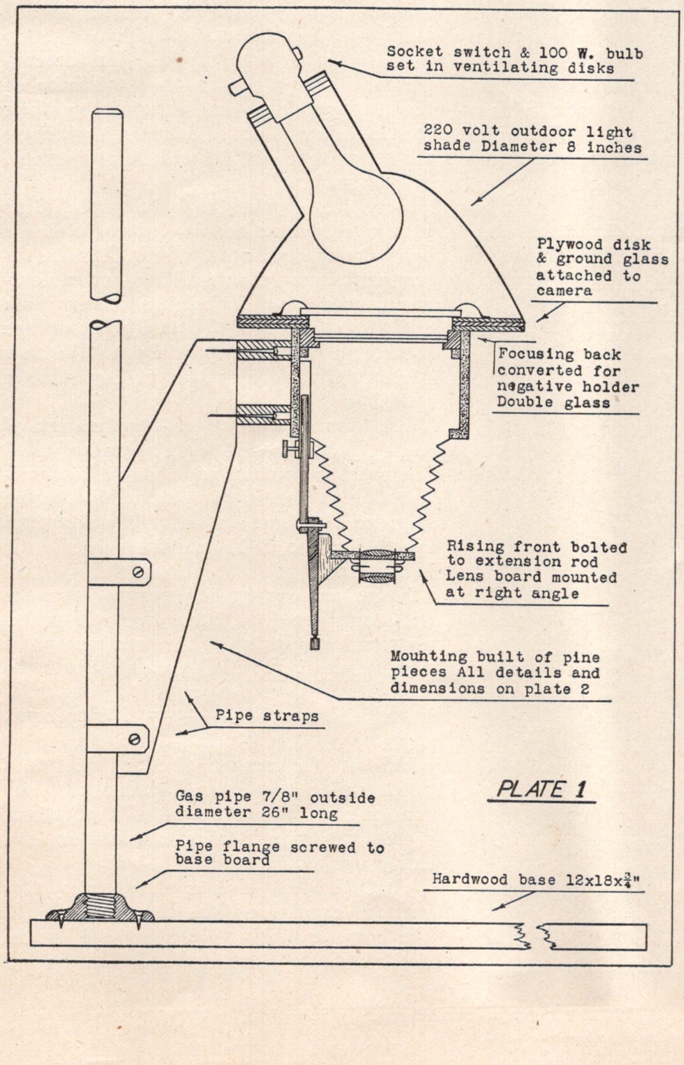

Socket switch & 100 W. bulb set in ventilating disks
220 volt outdoor light shade Diameter 8 inches
Plywood disk & ground glass attached to camera
Focusing back converted for negative holder Double glass
Rising front bolted to extension rod Lens board mounted at right angle
Mounting built of pine pieces All details and dimensions on plate 2
Pipe straps
Gas pipe 7/8" outside diameter 26" long
Pipe flange screwed to base board
Hardwood base 12x18x¾"

PLATE 1

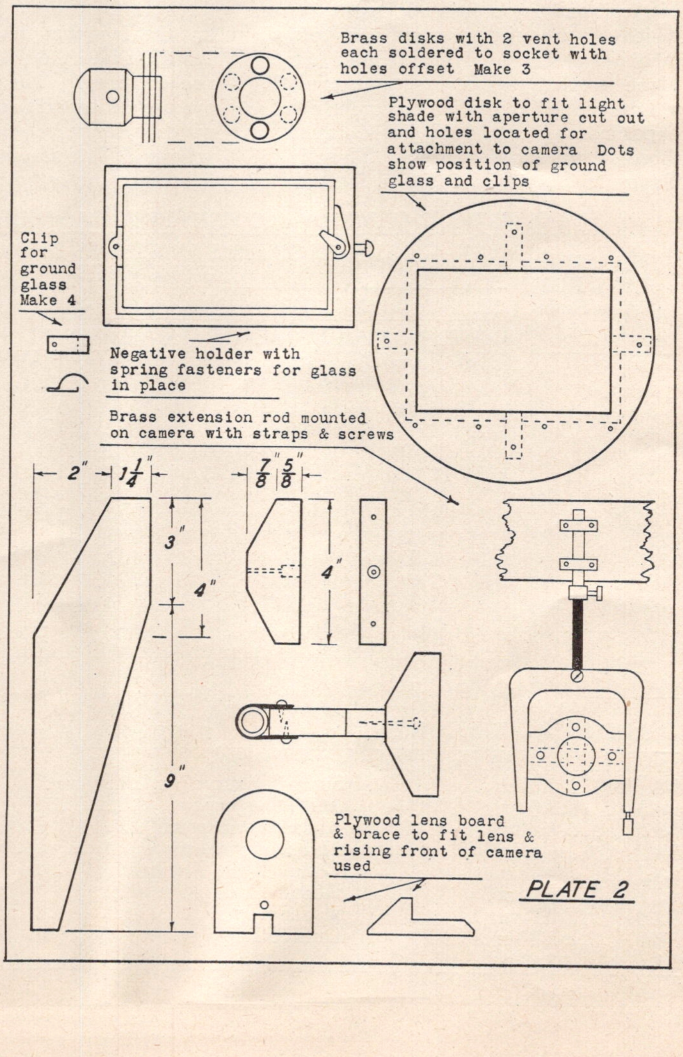

Brass disks with 2 vent holes each soldered to socket with holes offset Make 3
Plywood disk to fit light shade with aperture cut out and holes located for attachment to camera Dots show position of ground glass and clips
Clip for ground glass Make 4
Negative holder with spring fasteners for glass in place
Brass extension rod mounted on camera with straps & screws
2"
1¼"
7/8"
5/8"
3"
4"
4"
9"
Plywood lens board & brace to fit lens & rising front of camera used

PLATE 2

Our Monthly Exposure Chart

by JOHN B. RATHBUN

Use this chart freely as your guarantee against over-exposure or under-exposure.

TABLE NO. 1. TABULATED LIGHT FACTORS FOR APRIL, 1937
(Latitude 40° North)

WEATHER CONDITIONS	Local Mean Sunlight Time by Watch				
	10 A.M. to 2 P.M.	9 A.M. and 3 P.M.	8 A.M. and 4 P.M.	7 A.M. and 5 P.M.	6 A.M. and 6 P.M.
Sun bright—no clouds nor haze....	4	6	8	18 (Pan)	36 (Pan)
Light clouds—faint shadows.......	8	12	18	36 (Pan)	72 (Pan)
Moderately dull and misty........	18	24	36	72 (Pan)	None
Very Dull—dark gray clouds......	36	48	72	96 (Pan)	None

NOTE! In the above table, at points marked "Pan," we can use the figures shown with panchromatic film but must increase them from five to 10 times with orthochromatic films when the setting sun or rising sun throws a yellow or red light.

PROPER EXPOSURE depends upon so many factors that it is a difficult matter to incorporate all of them in one chart without the necessity of rather complicated and tedious calculations or else by the inclusion of some sort of slide-rule or mechanical calculator to solve for the variables.

However, in the following exposure tables for roll film, developed by our staff, there is only one calculation to make and that calculation is so simple that it can be made mentally without trouble. In other words, the only "loose variable" in our case is the ratio between the given f-number and the assumed standard opening of f-11.

Our tables take into account: the cloud or outdoor lighting conditions (weather), the month of the year, the hour of the day, the sensitivity of the film emulsion, the shutter speed and the f-number of the stop. This involves the use of two tables, Table No. 1 for determining the LIGHT FACTOR from the conditions controlling the light and, Table No. 2, a basic table, by which the Light Factor is converted into terms of shutter speed or stop opening.

Table No. 1 is true only for the month of April and for a Latitude of 40 degrees which covers the greater part of the inhabited portion of the United States. More southerly locations, approximating a Latitude of 30 degrees North, require exposures of only half the duration of those shown for 40 degrees. Thus, if the Exposure Factor is 6 for a Latitude of 40 degrees North it is only 3 for 30 degrees North, and so on.

It should be particularly noted that the hours are by "sun-time" for a given locality and that corrections must be made where daylight-saving time is in force.

Thus, at 4 P. M., with light clouds or a light haze, sun throwing faint shadows, the corresponding exposure factor will be 18 at 40 degrees North latitude or 9 at 30 degrees North latitude.

And—do not let the intensity of the late afternoon or early morning sun fool you by its apparent brightness, particularly after 4 P. M. It is not the intensity of the light that is of importance at this time, but the fact that the color of the light is changing into the yellows and reds of sun rise or sunset. The situation is saved by the use of panchromatic film at this time which is far more sensitive to the reds and yellows of late afternoon or early morning light than the ortho film.

TABLE NO. 2 CAMERA CONSTANTS AND SPEED AT f-11.

LIGHT FACTORS (From Table No. 1)	FILM EMULSION SPEEDS IN TERMS OF WESTON NUMBERS (CANDLE-FEET)									
	32.0	24.0	16.0	12.0	8.0	6.0	4.0	3.0	2.0	1.5 MfM
	SHUTTER SPEEDS BELOW IN TERMS OF SECONDS OF TIME									
1............	1/300″	1/200″	1/150″	1/100″	1/75″	1/50″	1/30″	1/25″	1/15″	1/10″
2............	1/200	1/150	1/100	1/75	1/50	1/30	1/25	1/15	1/10	1/8
3............	1/150	1/100	1/75	1/50	1/30	1/25	1/15	1/10	1/8	1/5
4............	1/100	1/75	1/50	1/30	1/25	1/15	1/10	1/8	1/5	1/4
6............	1/75	1/50	1/30	1/25	1/15	1/10	1/8	1/5	1/4	1/3
8............	1/50	1/30	1/25	1/15	1/10	1/8	1/5	1/4	1/3	1/2
12...........	1/30	1/25	1/15	1/10	1/8	1/5	1/4	1/3	1/2	3/4
18...........	1/25	1/15	1/10	1/8	1/5	1/4	1/3	1/2	3/4	1
24...........	1/15	1/10	1/8	1/5	1/4	1/3	1/2	3/4	1	1½
36...........	1/10	1/8	1/5	1/4	1/3	1/2	3/4	1	1½	2
48...........	1/8	1/5	1/4	1/3	1/2	3/4	1	1½	2	3
72...........	1/5	1/4	1/3	1/2	3/4	1	1½	2	3	4
96...........	1/4	1/3	1/2	3/4	1	1½	2	3	4	5
144..........	1/3	1/2	3/4	1	1½	2	3	4	5	6

APERTURE FACTORS		
f-11........	1.00 x	Denominator
f-8.........	2.00 x	“
f-6.3.......	3.00 x	“
f-5.6.......	4.00 x	“
f-4.5.......	6.00 x	“
f-3.5......	10.00 x	“
f-2.8......	15.00 x	“
f-2.5......	20.00 x	“
f-2.0......	30.00 x	“
f-1.5......	60.00 x	“

DAYLIGHT FILM EMULSION SPEEDS	Weston	Scheiner
Kodak Super-"X" (35 mm)...........	32	25
Super-Sensitive Panchromatic..........	24	23
AGFA Superpan......................	24	23
Kodak Verichrome..................	16	21
AGFA Plenachrome.................	16	21
Kodak N. C. Regular................	12	17
Kodak Panatomic....................	12	17
Kodachrome.........................	8	18
Dufaycolor..........................	8	18

And now we have progressed to Table No. 2 by which the shutter speed, stop or f-number, or both, are determined from the exposure factor just found. This table is, of course, independent of latitude, time or the month within itself but it considers the factors of the camera and the emulsion employed.

To avoid a lot of complicated calculations, we have assumed a standard stop number of f-11 as the basis of the tables, which is not far off under ordinary bright weather conditions and which is the stop ordinarily used for fixed focus box cameras. If any other stop, larger or smaller, is to be used, the shutter time is multiplied by the corresponding (f) stop ratio shown with the table. For the convenience of the reader, the sensitivity of the various films is indicated by their corresponding Weston numbers, which is a further feature that will be appreciated by our readers.

Now, let us take the light factor 18 as previously determined in Table No. 1 for light cloudy conditions at 4 P. M. Let us further assume that we have super-sensitive panchromatic film in the camera with a Weston value of 24, and that we are shooting with the stop at f 6.3. We now wish to find the corresponding shutter speed.

We follow down the left-hand column of Table No. 2 headed "Light Factor" until Factor 18 is reached, and then follow horizontally to the right under the Weston Number 24, where we find that the shutter speed for the f 11 standard opening is 1/15 second.

However, our given opening is to be f 6.3 and not f 11, hence we will multiply the *denominator* of the fraction by the APERTURE FACTOR which, for f 6.3 is 4.0. Then: $\frac{1}{4 \times 15} = 1/60$ second, which is the proper shutter speed for f 6.3 under the given lighting and film conditions. It will be noted that all of these factors are simple numbers and easily worked mentally.

PROBLEM. It is a clear, sunny day without clouds and the time is 2 P. M. We have a load of Verichrome in the

(*Continued on page* 69)

New Agfa Hypersensitizer

PHOTOGRAPHERS seeking greater speed than found in modern emulsions will be interested in the new and practical method of dry hypersensitizing with mercury vapor as developed through the experiments of Drs. Dersch and Duerr of the Agfa Ansco Research Laboratories. The technique is extremely simple and surprisingly effective, giving from 50 to 150 percent increase in emulsion sensitivity.

To effect the hypersensitizing, wrapped or unwrapped film is merely placed in a sealed container with a small amount of liquid mercury (0.5 gram) or silver amalgam containing a high percentage of mercury. The film is allowed to stand at room temperature from 36 hours for loose, or unwrapped material to about a week for wrapped or tightly spooled film. The sensitizing action of the mercury vapor is reported to be slow and so even that no streaks or spots occur. Actual contact with the film is prevented by placing the mercury in an open glass or metal retainer or by wrapping the amalgam loosely in porous blotting paper.

It was found that film showed a markedly greater increase in sensitivity when hypersensitized after exposure instead of before exposure. Other interesting features of the method are that it shows no apparent effect on the gradation or the grain size of the photographic material. Further characteristics which make the method superior to usual wet-hypersensitizing treatments include the following features reported by Drs. Dersch and Duerr:

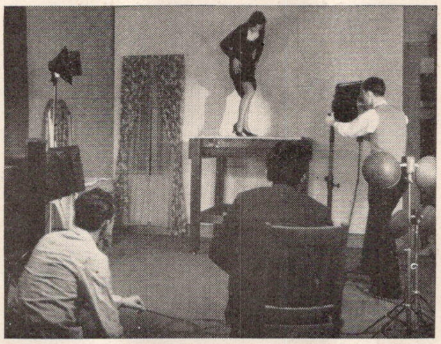
"(1) The film does not have to be put through a bathing process and then dried. (2) The mercury vapors are active also upon tightly wound spools of film, the sensitizing effect being uniformly spread over the whole length (e. g., of a 1000-foot roll of 35 mm. motion picture film). If sufficient time is available for hypersensitizing, the films need not even be removed from their original wrappers, as the mercury vapors diffuse sufficiently through the wrapping material. (3) The increase of sensitivity is general throughout the range of wavelength of light to which the film was originally sensitive. (4) The stability of the film is not permanently affected, although the increase in speed is gradually lost over a period of four weeks of aging. By a second treatment with mercury vapor the hypersensitization can be renewed in a film that has recovered from previous hypersensitizing."

Preliminary Camera Tests

BEFORE accepting delivery on a new camera, be sure to try out the shutter and also observe the action of the iris diaphragm. Cameras are frequently injured in shipment and even new shutters may possess certain defects that would be difficult to explain to the clerk when the camera is returned.

New Tricks for Camera Owners to Try

A monthly list of valuable kinks and hints for the amateur.
Popular Photography will pay $3.00 for each one accepted.



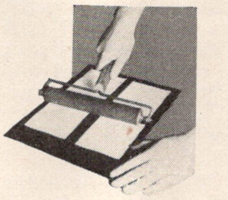
Getting the Angles

AMATEUR photographers sometimes wonder how the dramatic "up angles" of modern photography are made as it often seems that the photographer is shooting upward from below the floor.

An ordinary camera may be used for such angles. The secret, as revealed in this photograph, is that the model stands on a platform. In the home, an ordinary kitchen table may be used to achieve the same result which is very effective especially when stocking or lingerie pictures are to be made.

A Home Made Print Roller

FOR ferrotyping photographic prints a durable and efficient print roller can be made out of a discarded typewriter roller. The roller shown in the picture was made out of odds and ends at no cost to the maker.



The typewriter roller was obtained from a typewriter repair shop for nothing, after they had discarded it. The roller used to make the print roller was nine inches long and 1⅜ inches in diameter. As shown in the sketch a 3/16-inch bronze welding rod 10½ inches long was placed through the bore in the center of the roller. It was threaded on each end to allow for a stop nut, a flattened piece of welding rod, and a holding nut.

Two pieces of welding rod were flattened on one end and a hole drilled in them. The rods were bent at right angles 1½ inches from the center of the holes. They were then placed on the roller rod against the stop nut and fastened there with the other nut.

At the center of the roller these rods were bent down. A piece of hoe handle seven inches long was used for the handle. A hole large enough to allow the two rods to set firmly into the handle for a depth of three inches was bored in the handle. Spring tension in the two rods made them stay in place without using any kind of a fastener.

Before the rods were fastened to the roller a piece of bicycle tire tube was placed on the roller to make it pliable.

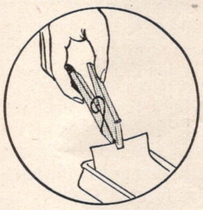
List Your New Camera

AS SOON as you bring your new camera home, make a memorandum of the camera and lens serial numbers and keep the list where you can find it. This may be useful, sometime, when you are called upon to identify your camera after it is lost or stolen.

The serial number of the camera may be on the front lens board or on the platen near the film track where it may be seen on opening the back of the camera. The lens number is inside the rim of the lens mount exposed directly to view.

Print-Tongs

AMATEUR photographers who do their own finishing will find these print tongs very handy for handling their films or prints in solutions, thus keeping the fingers out of the liquids. These will do quite as well as purchased print tongs, and may be home-made in a few minutes.

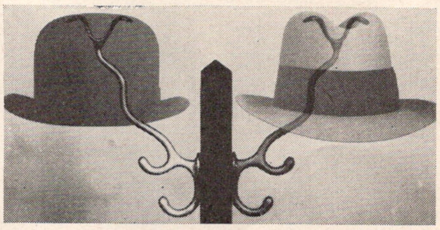


As will be seen by the photo, all that need be done to convert an ordinary spring clothespin into a pair of the tongs is to whittle off the ends of the jaws to a thin edge, so they may be slipped easily between the prints.

Double Exposure

TRICK photography is not only very entertaining, but frequently serves a very useful purpose as well. A hatrack manufacturer recently designed a new style holder and wanted to illustrate how practical the new design was for holding hats.

The story was clearly illustrated by the simple use of double exposure. The exposure was made in the following manner. The hat was placed in position on the rack, illuminated with a diffused light from a hood containing several 200-Watt lamps.



The phantom appearance, so effective here, is a simple trick in double exposure.

The exposure was made on pan film through a Bausch & Lomb IIb Tessar—f 6.3 lens through a Wratten K-2 filter; the stop set at f 16, the exposure for 2½ minutes. The hat remained on the hook for only half the exposure and was then removed and the exposure continued. The result is shown in the accompanying illustration.

Camera Club Notes

CAMERA CLUB OF THE BOSTON YOUNG MEN'S CHRISTIAN UNION. Meetings held at 48 Boylston Street, Boston, Mass., on the first Tuesday of every month. The officers are: Silvio Zanetti, Pres.; William L. Tisdel, V. P.; Herbert F. Wallstrom, Sec.; Harold I. Orne, Treas.

A recent novel introduction into their club activity was a Night Picture Hunt. Members paired up with cameras and unsynchronized flash equipment and drew assignments for getting a certain type of picture, returning with very amusing and interesting negatives.

FORT DEARBORN CAMERA CLUB. Recently moved to 75 East Wacker Drive, Chicago. 135 member limit has almost been reached. Quarters contain five different enlarging rooms. New officers are: Hon. Pres., Dr. Max Thorek, F. R. P. S.; Pres., Roy Franklin Dewey; V. P., Victor E. Johnson; Sec., Grace Hutton Kelley; Treas., Fred Lawrence.

LITTLE ROCK MINIATURE CAMERA CLUB. Organized in January, 1935. Just completed its second annual exhibition of prints. A novel plan of judging the prints was put into effect this year. The pictures were hung in a downtown show window, and ballots were provided for anyone wishing to vote. In this way the type of picture that the public admired most was determined. The club officials are: Dr. H. S. Stern, Pres.; A. O. Sanders, Sec.

MANITOBA CAMERA CLUB. Meets once a month. Membership of approximately 60; dues $5.00 per year. New officers are: J. M. Duncan, Pres.; Miss L. Ashdown, Sec.; H. M. Sharp, Treas.

During the months from October through May, excepting December, monthly competitions are held on specific subjects, membership being divided into junior, intermediate and senior groups.

During the summer several excursions are arranged.

METROPOLITAN MOTION PICTURE CLUB. New York. Four years old. Just held its Third Annual Guest Night at Hotel Pennsylvania. Officers are: Frank E. Gunnell, Pres.; Walter Mills, First V. P.; Charles J. Carbonaro, Second V. P.; Robert M. Coles, Sec.; Annette C. Decker, Treas.

Issues an interesting monthly bulletin called "The Close-Up," edited by Edith J. Schroeder.

PEORIA PHOTO FORUM. Membership, 50. Meets on alternate Tuesdays, at 333 South Adams Street, Peoria, Ill. Members of the Photographic Society of America, and also the Midwest Camera Club Circuit. Officers: Robert Coney, Pres.; Farnum Oster, V. P.; J. H. Sammis, Sec. and Print Director; Joe Grey, Treas.

Next annual members show May 1 to June 1.

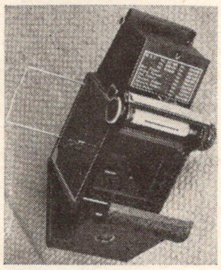
PHOTOGRAPHIC SOCIETY OF AMERICA. The Photographic Society of America held its first meeting in the club rooms of the Fort Dearborn Camera Club of Chicago, in September, 1933. Many internationally known pictorialists from all parts of the United States attended this meeting. The purpose of the Society is to encourage the use and

(*Continued on page* 70)

What's New in The Trade

Latest reports on new cameras, new attachments, new equipment.

THE Pilot Six, a new camera of the reflex type, has just arrived from abroad. It has shutter speeds of 1/25, 1/50, and 1/100, as well as bulb and time. Of metal construction throughout, it is covered with a real leather cover; it has a self-erecting focusing finder lens with magnifier glass, as well as wire Iconometer finder. It is expected that these cameras will be priced as follows: With F 6.3 lens, $16.50; with F 4.5 lens, $23.50; with F 3.5 lens, $30. The Pilot Six takes 16 exposures on 120 film.



The Pilot Six, a new camera of the Reflex type.

* * *

AN interesting line of camera accessories has recently been brought to our attention. They are products of Wm. J. Grace, who is located at 4064 Stanford, Dallas, Texas. Several of these products are devoted to the constant bugbear of the candid photographer, that of keeping the camera steady for comparatively long instantaneous exposures. The Beltipod is a one legged telescoping height camera support which hooks over your belt, trouser top, or coat button. All of the weight of the camera is supported at your waistline and the camera is braced by this support and your two arms. With a swivel top this device sells for $5.00. With plain screw top, the price is $3.00.

Another item designed for somewhat similar use is the Chain-O-Pod, priced at $2.00, which consists of an adjustable chain fastened to the camera at one end and provided with a loop on the bottom for you to step into. Pulling up against the chain steadies the nerves and the camera, and a sharp picture is the result.

Recognizing the popularity of the Argus camera, Mr. Grace is producing a tripod socket for this camera priced at $1.00, with an extra charge of 50c for a safety neck cord. This neck cord can also be used with most other miniature cameras, as it is supplied with a nickel plated plug which screws into the tripod thread.

* * *

JUDGING distance seems to cause many people a lot of difficulty. It is only consistent users of cameras, such as press and commercial photographers, who learn to judge distances accurately without some measuring device. Carrying a short tape line is all very well when distances are short, but when taking outdoor pictures at medium distances, with the lens wide open for fast action shots, there is no substitute for a reliable distance meter. The Mimosa American Corp., 485 Fifth Avenue, New York City, who are also distributors of the Leudi Exposure Meter, have recently placed on the market the Bob Distance Meter, selling for the low price of $6.50. This range finder is very simple to operate: in looking through the eye piece you will find two images of your subject. Simply turn the wheel until the two images move together and are perfectly matched. The distance from you to the object is then indicated on the dial. This meter is small and compact, and finished in brushed nickel. It covers a range of distances from 3½ feet to infinity.

We cannot overemphasize the need of a reliable exposure meter. While the Leudi is the smallest and least expensive one that we know of, it is extremely accurate and simple to operate. It can be used by anyone with or without glasses, and measures only 1"x1½"x⅜". It has a wide exposure range, from brilliant outdoors to dark indoors. It lists at only $2.15, with a slip-on leather case.

* * *

WE have all been so used to seeing Eastman Ciné-Kodaks in the conventional rectangular shape that the new angled top design of their new 16 MM model E, selling for a new low price of $48.50, was a pleasant surprise. This angled top makes it easy to grasp the camera comfortably and firmly, and removes the necessity of removing your hat when sighting through its direct view finder system.

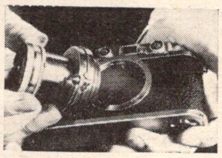
This new camera has three speeds, 16, 32, or 64 frames per second. A substantial leather carrying strap is center balanced for convenient portability. It is finished in a black wrinkle finish, and has a sturdy professional appearance. It takes 50-ft. or 100-ft. rolls in either black and white or Kodachrome.

* * *

THE miniature camera and its extreme portability have been largely responsible for the demand for faster and still faster lenses. Wherever there is light enough to see, candid photographers want to be able to take pictures. It is not so long ago since an F 4.5 lens was considered a fast one, but today the owner of the miniature uses lenses this slow only when his pocketbook will not enable him to buy the faster, and naturally more expensive, lenses of today.

E. Leitz, Inc., of New York, makers of the famous Leica camera, have recently announced the new Leitz Xenon F 1.5 50 MM lens which is 75% faster than their F 2 lens which up to now has been their fastest. This lens, which has an angle of view of 48", is supplied in a focusing mount at $213.

The F 1.5 lens is complete for use with the automatic range finder of the Leica in the usual manner, and the mount is so designed that it can be focused in two ways — by moving the regular locking thumb knob, as with the other Leica 50 MM lens, or by grasping the outer knurled collar of its mount. As the Leitz Xenon F 1.5 is focused it does not rotate but moves in and out on its mount, simplifying the use of filters such as the graduated sky filters.



The interchangeability of the lens on the Leica is one of its outstanding features.

* * *

AN interesting booklet on Zeiss photo lenses has been prepared under the title of "Zeiss Objectives." A rather complete description of most of the lenses which are made by this outstanding manufacturer of lenses and optical instruments are contained in this interesting booklet. Carl Zeiss, Inc., 485 Fifth Avenue, New York, are also manufacturers of the Con-

(*Continued on page* 69)

A Glossary for Photography

(*Continued from page* 54)

ACID FIXING BATH. A fixing bath of sodium hyposulphite maintained in an acid condition by the use of acetic acid or tartaric acid for hardening the emulsion and clearing the highlights of a film, plate or developing type paper. Acetic acidity is desirable for hardening the film during warm weather development.

ACIDITY. A measure of the acid activity of a solution. See ACID TESTS.

ACID HARDENER. An acid bath, usually acidified with acetic acid, used for hardening the gelatin emulsion in warm weather.

ACID QUICK STOP. See ACETIC SHORT-STOP.

ACID SALTS. Salts in which the acid has not been completely neutralized by the basic substance so that they still exhibit acid characteristics.

ACID TESTS. The simplest, but not highly accurate method, of testing for acidity is to immerse a strip of blue LITMUS PAPER into the solution. If the bath is acid, the litmus will turn from blue to red or may be entirely bleached white in very strong acid solutions.

ACTINIC. That portion of white light or of the spectrum, which causes chemical or mechanical changes to take place. It is this light that creates images upon light sensitive plates, paper and films. While the blue, violet and indigo portion of the spectrum is usually considered as the most actinic band of light, yet the actinic value also depends upon the nature of the substance affected. Orthochromatic films, for example, are most affected by blue and green rays, while the panchromatic emulsions are most strongly affected by the reds, yellows and oranges.

ACTINOMETER. An instrument for measuring the ACTINIC value of light according to a given scale.

ACTINOSCOPE. See ACTINOMETER.

ACTINIC FOCUS. See FOCAL LENGTH.

ACTIVITY. The comparative rate at which chemical reactions take place in producing chemical compounds.

ADAPTER. A device employed as an intermediate connection between two or more parts of different size or form.

ADAPTER (Film Pack). A frame used for fitting film-packs to roll-film or plate-holder cameras, making it possible to use film-packs on any sort of camera.

ADAPTER KITS (Reducing Kits). Small frames placed inside of glass plate holders for holding smaller plates or for holding film in place within the holder.

ADAPTER (Lens). An adjustable device placed on the lens-board of a camera for accommodating different sizes and types of lenses to the camera. It is usually constructed on the principle of an iris diaphragm, the size of the central lens opening being varied by opening or closing the leaves surrounding the opening.

ADAPTER (Roll-Film). A frame for attaching a roll-film carrier to a plate camera.

ADMITTANCE. The amount of light admitted to a plate or film through a lens or other opening. Usually given in terms of LUMENS.

ADIACTINIC. The reverse of actinic or non-actinic. This is applied to the safe-light windows of dark-rooms.

ADURAL. A developing agent.

AERIAL CAMERA. A special camera designed for use in airplanes by which views are taken from a great altitude. No bellows is used, because of the wind-pressure, and the lens has a long FOCAL LENGTH, usually greater than 12-inches and sometimes up to 42-inches.

AERIAL MAPS. Maps made of a given country or terrain by means of aerial cameras. They can be measured off to scale when the altitude of the airplane and the focal length of the camera are known.

AERIAL MOSAICS. Maps made up by assembling small aerial section maps.

AERIAL OBLIQUES. Aerial views taken with the camera pointing at a small angle with the horizon instead of pointing straight down as is done in aerial map photography.

AERIAL PERSPECTIVE. An impression of depth or distance in a photograph that depends upon effect of the atmospheric haze in suppressing distant detail.

AERIAL PHOTOGRAPHY. Photography at high elevations from an airplane, balloon or airship. These may be for the purpose of mapping, showing the layout of buildings and industrial plants, for military observation or for meteorological investigation.

AERIAL SCREEN. An open meshed screen or curtain placed between the camera and the view for creating the impression of fog or heavy rain. Flashes directed on the screen give the effect of lightning.

AEROGRAPHY. Plotting positions of cloud masses, fog banks, etc.

Ag. Chemical symbol for SILVER.

AGAR (Agar-Agar). A vegetable gelatine obtained from a variety of seaweed found in the Pacific ocean. It has been employed for coating papers to obtain certain special effects and has also been suggested as a substitute for the bone gelatines now used in emulsions because of its higher melting temperature.

AGED DEVELOPERS. Certain classes of developers, employed for suppressing grain in miniature negatives, give much better grain suppression after they have been held or aged for several months after mixing.

AGENT. Any substance intended for performing a given effect. Thus, developing agents are the essential chemical elements in a developer that cause the image to appear.

AIR-BRUSH. A device used for spraying paints, colors or other fluids in coating surfaces. In photography it can be used for vignetting or making backgrounds on the print. It can also be used for coating paper with fluid emulsions as in the gum-bichromate process.

(To be continued in the next issue of Popular Photography)

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Mapping with An Aerial Camera

(*Continued from page* 48)

specially made to avoid shrinkage, which throws a photograph out of scale and reduces its value for mapping. Infra red film has been tested and difficulties involved in its use have been overcome. It may be adopted any time but it will involve changes in map-making procedure. The lens used is a Ross 8-inch working at f4.5.

The camera has a focal plane glass plate etched with a cross at the principal point. This cross shows up on the photograph and gives the optical center, useful in plotting the photographs and calculating the allowance to be made for any tilt in the plane or any deviation from its course at the time of exposure. It is also equipped with an in-between-lens shutter giving exposures of 1/50th, 1/100th and 1/150th second. Most of the oblique work is done with an exposure of 1/50th owing to the long stretch of haze which must be cut through. If special close-up shots are needed from a lower altitude a lighter filter is used with an exposure interval of 1/150.

Flight lines are laid out on parallel courses usually from east to west and spaced 10 miles apart. Cross flights from north to south are made at the ends of a series of east and west flights and at intervals across them sometimes, usually along lines taking in known ground points.

THE VERTICAL METHOD

WHILE oblique photographs are taken from an altitude of 7,500 feet, for vertical work the normal altitude is 10,000 feet and on control flights and in mountainous territory from 12,000 to 15,000 feet. The same camera is used in the vertical as in the oblique method but only the center of the three units is in operation.

A camera is used to determine the drift or angle of crabbing and the time interval between consecutive exposures. This interval has to be arrived at for different altitudes by a process of trial and error as the pictures must overlap one another in the line of flight by 50 to 60 percent to permit of their use in stereoscopic pairs. When it has been determined it is set on the intervalometer to govern the automatic tripping of the shutter.

Parallel flights are made as in the case of oblique photography but the flights are spaced so that one strip of pictures overlaps another. To avoid risk of an unphotographed gap the flights are usually arranged to give a side overlap of 40 per cent. Control flights are also made across the parallel flight lines at suitable intervals or between points which have been astronomically located on the ground.

The camera man levels his instrument into a vertical position when the aircraft is flying straight and level at the altitude of photography and then makes it fast. He relies on the pilot by careful flying to maintain the camera in the vertical position and on the intervalometer to snap the pictures at the proper intervals. Should the camera levels indicate any constant error of tilt he corrects for it.

MAPPING FROM OBLIQUE PHOTOGRAPHS

TRANSFORMING a bundle of aerial photographs into a map is a problem for the mathematician and the draftsman. On the mathematical side it involves a score of nice computations which, once completed, serve for any number of maps. The drafting end, however, takes many hours of patient labor. Maps made from oblique photographs are produced on a scale of one inch to four miles and an average map sheet covering 6,000 square miles represents about 3,000 photographs and 350 man days of work.

A projection sheet is first prepared on a scale of one inch to one mile and on it is plotted all available control information such as observation points, surveyed lines and traversed waterways. Photographs covering the area are then examined and indexed on another map either drawn for the purpose or taken from the best available previous map.

Flights which are well controlled by containing known ground points are first laid out on the projection sheet, the central views of each flight being dealt with first. When the central views are laid out in the line of flight the foreground of one overlaps the background of the previous one and it is possible to select a point in the track of the aircraft on the foreground of one picture and join it to another in the track on the aircraft in the background. This latter point will also appear in the foreground of the next picture. These points are then linked with a line which is projected through the whole series of views along the line of flight and is called the azimuth line. With the pictures laid out in this way and the azimuth lines drawn scale points are selected, one on each side of the line in the foreground of each picture. These identical points are also marked on the background of the preceding picture and show near the center owing to the smaller scale of an oblique photograph at the background than the foreground.

Accurate measurements on oblique pictures are obtained by the use of glass grids superimposed over the pictures. These grids are prepared as a perspective of a system of squares made with parallel lines, one set of lines vanishing towards the center foreground. They serve to take the tilt out of the pictures. As the tilt varies with the altitude different sets of grids are prepared for each altitude. By applying the proper grid to a series of photographs marked with scale points the map-maker can make a skeleton plot of the area covered and draw in the land features in correct proportions.

Skeleton plots of the central views are assembled in strips and checked with the projection sheet for adjustments in overall distance. The part of each photograph desired to be plotted in detail is inked in with white ink and plotted on an individual sheet for transfer to the projection sheet. Plots of the side views are made in a similar way and hung on to the central views.

The map-maker has a good deal of latitude in his compilation as the information taken from each photograph is usually contained in a two-mile zone, extending from one mile in the foreground of the principal point to one mile in the background. On a published map the reduction to the one inch to four mile scale at the foreground limit of the zone is about nine times and at the background limit about 25 times.

When all the information is plotted in on the projection sheet it is photographically reduced to a two-mile scale for the final work of the draftsman and then photographically reduced to the four-mile scale.

MAPPING FROM VERTICAL PHOTOGRAPHS

BEFORE the days of the radio or even the gramophone *no* American front parlor was complete without a stereoscope and a set of views. This instrument gave a life-like reality to pairs of photographs by placing them in the same relation to the eye as the real thing would have if one were looking at it and was expected to amuse the favored guest while mother and the girls prepared the dinner and father and the boys did the chores.

Today the stereoscope has vanished from the home but it finds a place in the workshops of surveyors engaged in making maps from aerial photographs. The Barr and Stroud Precision Grid Stereoscope is used in the interpretation of the vertical photographs. The stereoscope brings out depth and so is invaluable in reading pictures taken over rough country where the vertical method, slow and expensive as it is, must be used.

The preliminary steps in mapping from vertical pictures, preparation of the projection sheet and indexing of the photographs are the same as previously described for oblique pictures. The stereoscope comes into use in linking up the principal points and the scale points of the photographs. As they overlap one another by more than 50 per cent the same points appear on three pictures and the preparation of a skeleton strip plot in the approximate scale of the photographs is *not* difficult.

By measuring the distance on the strip plot between controlled points and comparing it with the projection sheet it is possible to reduce the plot to an assembly scale of ½ inch to one mile. Adjoining strips of these reduced plots are then pasted on the projection sheet and the whole is photographically reduced to a scale of one inch to one mile at which stage a blue print is made for finished drafting. From the vertical process the finished maps are usually produced on a scale of one inch to two miles.

A map sheet on this scale covering approximately 1,500 square miles involves about 2,500 photographs and about 400 man days of work.

Contours may be drawn on a map made by means of vertical pictures. They are usually based on a dense network of con-

(*Concluded on page* 61)

Aerial Mapping

(Continued from page 60)

trol heights selected on the ground and the use of the stereoscope to project the contours from the control heights.

WEATHER TRICKS

WEATHER and other conditions often play tricks with aerial photography. Frequently objects known to exist on the ground will *not* appear in a photograph or will be so faint they can only be detected by prolonged and careful study. The roof of a house surrounded by trees may *not* come out. A trail may be easily seen in one picture and *not* at all in another while in a third it may be so faint it can be traced only by reference to the first picture.

If the sky is overcast a picture may bring out submerged shoals, rocks and sandbars under still water. But in bright sunlight the camera will *not* penetrate beneath the surface of the water. A water surface may come out either black or white in an aerial photograph. A cloud in the background of an oblique photograph may easily be mistaken for a lake unless checked with the foreground of the next picture.

COST

THE expensive equipment required in this large-scale method of aerial mapping puts it beyond the reach of any but governments or mining and exploration companies. The same principles, however, can be applied on a smaller scale. Good photographs from the air can be made with less elaborate cameras especially if taken from lower altitudes.

With complete ground information, compared with an almost total lack of it in the north country, the owner of a farm or ranch could make a map of his property from the air without difficulty, taking vertical photographs and using a stereoscope. He could also compile a composite photograph of a given area which would be fairly accurate in scale by eliminating the overlapping parts of the individual views after linking them together by means of control points.

By the use of some ingenuity, and with a thorough understanding of the subject, fairly good results can be had with a medium priced outfit, but such equipment is limited in scope and accuracy. Several small two-man "corporations" have started out with small cameras and have made considerable amounts of money on "tax surveys" for the various county and municipal officials.

The cameras, in these cases, were of the oblique type with much of the auxiliary equipment, grid screens, etc., of the home-made type. One firm in the United States has been operating for several years with such various odds-and-ends of equipment which included salvage materials from the U. S. Army Air Corps. Where there's a will there's a way.

By the use of the stereoscope we add a third dimension to photography so that solid bodies appear in natural form and elevations are distinguished from depressions.

END

Catching Crooks

(Continued from page 28)

found in his possession when arrested, the chisel making precisely the same marks when similarly applied.

A noted French criminologist reports a case in which an escaping burglar had fallen face down in a pile of sand and left so clear an impression that, when photographed, the size and markings on the buttons of his coat could be definitely identified.

The scientific criminal investigator—may his tribe increase—leaves absolutely nothing at the scene of a crime unexamined or disregarded as of no consequence. He finds clues and evidence in the most insignificant things, such as dust, mud, threads of cloth, hairs, powder, lip-stick, and ashes. And, of course, weapons, bullets and shells, if found, are treated and preserved with the utmost care.

Thus, in a horrible murder case in New York City, involving the brutal killing of a young bride some weeks ago, the crime was solved within thirty-six hours through a laundry mark on overalls the murderer had discarded, hair clutched in the hand of the victim, blood on the killer's shoes, and finger-prints on the bathroom door.

In all such cases the camera is brought into constant play in testing, as well as examining, the kinds of objects mentioned and in putting the evidence that they furnish into practical form for use in detecting the criminal and later for presentation in court, frequently, of course, in conjunction with the microscope, the spectroscope, and the fluoroscope.

In the notorious Hauptmann case, for instance, scores of photographs were introduced as exhibits and played a conspicuous part in forging the evidential chain that convicted him of the murder of the Lindbergh child. Among the most interesting of these were enlargements of the ransom notes and of the wood on the fatal ladder matched with a board in the defendant's attic and with other pieces found on his premises.

Among those who make extensive use of the camera in this connection are the ballistic experts who employ it in conjunction with the comparison microscope to discover, and later to demonstrate, the similarity of bullets or shells and the fact that a given shell was fired in, or a given bullet from, a given gun. It was such use of the microscope and camera conjointly that led to the identification and conviction of "Two Gun" Crowley as the murderer of Patrolman Hirsch, of Nassau County, New York, a few years ago.

Crowley had previously left a bloody trail as a ruthless killer, and it was by means of bullets in the possession of the police at the time of the killing of Hirsch that they were able immediately to determine that Crowley was the man they wanted. When he was subsequently captured in a spectacular raid on the apartment in which he was hiding, the pistol from which the fatal bullet had been fired was found in his possession and

(Concluded on page 62)

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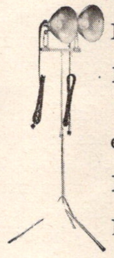

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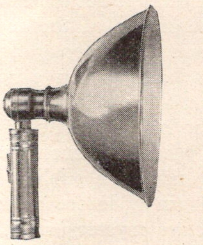

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Catching Crooks

(*Concluded on page* 61)

helped to clinch the evidence that finally sent him to the electric chair.

How the spectroscope may be employed in connection with the camera to catch criminals was shown a few years ago in a burglary case in Rochester, New York. Arrested as a suspect when seen leaving the building in which an attempt at safe robbing had just been made, he was found to have a small red stain on his sweater. The stain, which was very small, was carefully removed and examined under the spectroscope and was discovered to be putty. When compared in the same way with putty taken from the broken window through which the intruder had left the building and with ordinary putty, it was clearly shown to be identical with that taken from the window. Confronted with this evidence in the form of photographic enlargements of the spectral lines, the accused promptly pleaded guilty and received his sentence.

The fluoroscope is a veritable box of magic. With it the work of the forger may be exposed even though he used the same pen and ink as the original writer and simulated his writing so cleverly that the human eye cannot see any difference, a single hair may be made to identify the head from which it came, a speck of dust may serve to place the criminal on the spot of his crime at the moment of its commission, and blood stains washed whiter than snow can be made to stand out like a blotch of ink on a surface of gray.

It makes even ashes yield their secrets, and in a recent New York case two police laboratory technicians put together and, with the aid of the fluoroscope, photographed counterfeit bonds that the criminal had attempted to destroy by first burning them and then sinking the ashes in a sack in the Hudson River. "Black light," the ultra-violet and the infra-red rays invisible to the naked eye, constitutes one of nature's most valuable gifts to the scientific criminologist.

So each day we move nearer to the time when science and scientific instruments will make the unsolvable crime an impossibility. But, as we well know, it often happens that when the officers of the law have determined who committed a given crime, that party is not to be found. In such cases photographs of the fugitive are, of course, the first thing sought.

A wanted man's pictures can generally be quickly scattered broadcast over the country and become his greatest source of danger. Everybody has seen such pictures in the post office and other public places.

Many magazines in addition, especially those in the detective mystery field, now carry the photographs of notorious fugitives, and many are apprehended as a result. Just recently, for example, a patient in a New York hospital, a 22-year old drug store messenger, Jacob Bastocky by name, was reading one of these magazines when he saw a face that looked familiar. It was on a page devoted to notices of rewards for information leading to the arrest of the parties shown, and Bastocky recognized it as the picture of a fellow patient only two beds away. Through an orderly he quickly passed word to the police, and within forty-eight hours that "wanted man" was on his way to Los Angeles to answer to a charge of burglary.

True Detective Mysteries alone has been directly instrumental in catching 112 wanted criminals since 1931. Master Detective, another magazine, has helped catch 55 since 1934.

Some of us, however, are not very good at recognizing persons from their photographs; and, of course, there are many personal characteristics that no picture ever reveals. It has, therefore, been suggested that, instead of merely taking still photographs of a convicted criminal in various poses, as now, the police take moving pictures of him, and that, if he is later wanted again, these pictures be shown in every theater that can be induced to cooperate with the law enforcement authorities in this respect.

The wanted man might meanwhile change his features and his general appearance, but, it is argued, it would be practically impossible for him to change his walk, his general bearing, and all his other personal characteristics beyond recognition. Somebody would be sure to spot him no matter where or how he tried to hide himself.

Now, in all this the amateur camera enthusiast may well play an interesting, a public-spirited and often a profitable part. For, if he combines a little of the detective instinct with which we all seem blessed with his other hobby, the possibilities are limitless. This is especially true in places where the only official detective in time of need is some constable or sheriff elevated to office, not because he knows anything about catching criminals, but because he is a good fellow and belongs to the right political party.

Let the man with a camera use it unceasingly but with discrimination, snapping suspicious characters and suspicious happenings; let him trail the officers of the law as some men trail the fire engines; let him make himself an ingenious camera detective; and he'll have a pastime bound to be continually thrilling, a bit dangerous, and often quite profitable.

END

Shooting the Cover

(*Continued from page* 23)

thin deposit of aluminum by evaporation, the density controlling the reflection. A portion of the light striking mirror M1 is reflected upward through a violet filter to a sensitized "color blind" plate. This produces the violet record which is finally to be printed with yellow ink.

The balance of the light that was not reflected upward from mirror M1 passes *through* this mirror and strikes the surface of mirror M2, where the light is similarly divided into two parts. One part is reflected and passes through a compensator (C), then through a green filter on to a panchromatic or orthochromatic plate, which produces the green record which is finally printed in red ink. The balance of the light which struck mirror M2 passes through this mirror straight back to the rear of the camera, going through an orange filter to a panchromatic plate, producing the orange record finally being printed in blue ink when the photographic plates have been converted by engraving processes to printing plates.

One of the major difficulties encountered in registering one-shot color cameras is the difficulty of keeping the plates in their proper plane. Any slight deviation is enough to throw one or more of the images out of register. In Young's camera, register is maintained within .0015 inches by means of spring-actuated thrust frames which force the plates into correct position.

Another main feature of this camera is the ease with which filters can be changed to accommodate varying light conditions In changing from a photoflood or photoflash illumination to daylight, one or more of the filters is changed in a few moments without any effect on the register. Mirrors also can easily be removed or replaced without altering the register of the camera. The effective speed of this camera is approximately two-thirds the speed of Kodak film. The camera is constructed throughout of duralium.

The lovely young model, Claire Powell, used for this picture is a resident of Riverside, Ill. She is 22 years of age and attended the Riverside-Brookfield High School. She has been modeling for 3 or 4 months and previous to that was a professional dancer. END

Coming!

The next issue of POPULAR PHOTOGRAPHY will be even more peppy and full of interest than this, our first issue. We haven't room to list all of the outstanding stories in the May issue, but here is just a suggestion of what is to follow.

1. Photographing Pets.
2. Proper Use of Filters.
3. Better Pictures with Your Movie Camera.
4. How to Win Salon Awards.
5. Exposure Table for May.
6. The Amateur and the Law.
7. Table-Top Photography.
8. Hollywood Stars and Their Cameras.
9. An Inexpensive Lab.
10. Pattern Shots by Grahamer.
11. Selecting a Movie Camera.
12. Shooting News in Color.

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Popular Photography

Candid Shots

(*Continued from page* 4)

beauty to the American public, with due apologies to Linda for the way Jack Hazlehurst treated her—photographically speaking, of course.

* * *

WHILE your editor was in New York selecting material for this issue, he came across some marvelous pictures taken by Pat Terry with his Contax at the opening of Minsky's Burlesque Theatre. The pictures were figuratively still wet, but we were so impressed with them that we bought them on the spot. Later on we had a staff reporter chase Pat down to his lair and wrung from him the complete story on how these pictures were taken. We hope you like them.

Readers who want to duplicate Terry's pictures had better hurry. If the reformers don't close up Minsky's shutters, the Society for Protection of Actors will padlock the shutters on candid cameras. John Gielgud, famous Shakespearean actor, complains that the "candid camera fiends" in his audience get on his nerves. Tch, tch, Mr. Gielgud, perhaps if Jean Harlow played Ophelia to your Hamlet, the miniature camera hounds would forget their cameras.

* * *

MANY, many interesting articles are being scheduled for the next issue. Don't forget that POPULAR PHOTOGRAPHY is a magazine of, for and by its readers. Let us know what you like and what you don't like and we'll try to shoot the stuff that pleases you most.

* * *

Au revoir 'til next month.

Telephoto Lens

(*Continued from page* 50)

Avenue, New York, N. Y. The purchaser has the pick of three lenses for his primary equipment, the Trioplan, f2.8 (10-cm)—$175; the Zeiss Tessar, f3.5 (10.5-cm)—$1.95, and the Meyer Makro-Plasmat, f2.7 (10.5-cm)—$245. Since the normal focal length for a 2¼-inch square film is three inches, you will notice that these lenses are already long focus, being about 25 per cent longer in focal length than ordinarily supplied. This makes this camera ideal for portraiture and theater shooting from the balcony.

Lenses of longer focal length available to the Primarflex, and on which prices may be obtained on request, are the following: Zeiss-Biotessar, f2.8 (16.5-cm); Zeiss-Tessar, f3.5 (21-cm); Zeiss Tele-Tessar, f6.3 (32-cm); Meyer Primotar, f3.5 (18-cm); Meyer Tele-Megor, f5.5 (30-cm), and Meyer Tele-Megor, f5.5 (40-cm).

It may be that after reading this article on the miniature telephoto you may decide to drop any intentions you may have had in this direction, but should you be seriously considering the purchase of a camera that provides for interchangeability of lenses it is hoped that the observations made here will be of some help.

END

Cave Pictures

(*Continued from page* 51)

room, closeness to object being photographed and a host of other factors.

You don't need special equipment of any sort aside from a flash gun to make cave pictures. Many of my pictures were made with a little gadget I had a tinsmith make at an expense of 20 cents. Simply a bent piece of heavy tin with a sleeve to stick a piece of dowelling into for a handle. I shot the powder with dynamite fuse. Crude, but it worked for years,—and still would except that Santa Claus brought me a fine Victor gun one Christmas.

Any ordinary camera, miniature, box or otherwise, costing from a dollar on up, will be sufficient for cave work if you have nothing else. Both my sister and my daughter who accompany me on all of my cave trips, frequently use their No. 122 kodaks utilizing the same flash I shoot for my own pictures. They have taken some marvelous shots.

I've seen some wonderfully fine work done with cheap little box cameras and I have a friend who has at least a couple of hundred dollars tied up in a miniature camera with all of the dofunnythings he can buy and hang on it. His work is terrible. I'm trying to say, as you may have guessed, that it isn't always the equipment you have which determines the success or failures of your work. If you can make good, artistic pictures on top of the ground, there is no particular reason why you shouldn't be able to get good ones underneath.

Don't forget what I said about flash-powder being dangerous stuff. Take no chances with it. A bad burn in a cave might be doubly dangerous on account of the difficulties getting the injured one to a doctor. It is all right to be brave and daring *on* the earth, but *beneath* it and *above* it—BE CAREFUL.

If you have a camera with which you can make good pictures, the ability and experience to produce good stuff, try your hand in a cave. Delve down into subterranean labyrinths and see what you get. It's a lot of fun, but it's also hard work. And watch your step and be sure you can find your way out of the cave when you get through with your picture making. That's the most important thing of all,—to get *out* of the cave when you're through.

END

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Makeup

(*Continued from page* 30)

is sure that she will get the kind that she wants to have.

The sitter is next allowed to make up her eyebrows with the dermatographic pencil. The shape of the lips and the shape of the eyebrows go a long way toward determining the expression which the sitter will have in the portrait, and for that reason it is important that the sitter be allowed to use her own judgment in making up both of these features.

After this the eyelashes are treated with mascara, but in this case it is not out of place to emphasize the makeup and put it on a little more heavily than is normally used in street wear. It is well to let the sitter use her own mascara or whatever other eyelash makeup she is used to using, merely instructing her to apply it a little more heavily than usual.

When this has been done, the makeup should be checked over, perhaps rebrushed with the face powder brush and any necessary corrections made in the details. The sitter may then comb and fix her hair and the photographer is ready to make the portrait.

Fig. 2 is a portrait of the same girl who appeared in Figs. 1 and 2. In Fig. 2 we have a very simple flat front lighting but a careful application of the makeup just described, has given the sort of flesh quality that was missing in Fig. 1. Fig. 2 is a straight portrait with no retouching of any sort on the finished negative.

The makeup is removed with cold cream. The face should be well massaged with cold cream until all the makeup is completely dissolved and is then wiped thoroughly with cleansing tissue until every trace of paint is gone. It is advisable to wash the face afterwards with warm water and plenty of soap.

With this type of simple makeup, the greatest need for retouching, namely that of giving a good complexion to the face in the portrait is removed. Retouching usually is also resorted to for the purpose of removing or softening wrinkles, and for removing blemishes. It is impossible to remove blemishes other than variations in coloration with makeup. If the sitter is crosseyed it will still be necessary to resort to retouching to correct the defect, as will be the case with gross malformations of anatomical structure.

Neither can wrinkles be removed by makeup. It will be found, however, in the case of elderly people, that makeup often does away with the necessity for removing or softening these wrinkles. When making portraits, especially of women of late middle age, it is found that removing wrinkles makes such startling changes on the face that it loses both character and likeness.

The application of makeup, however, will give the sitter a school girl complexion which will of itself give a suggestion of youth and counteract the wrinkles. In this way character is preserved and yet the pleased recipient of the portrait finds that she lost a number of unflattering years in the photographer's dark room.

It might be pointed out at this point that the effect of a good makeup will in a large part be neutralized if the negatives are over-exposed, which always gives chalky flesh tones. A thin, but fully modeled, negative should be aimed at in making exposures for portraits under the conditions outlined here.

Every really dyed-in-the-wool amateur photographer has wished at one time or another to make character studies. Perhaps he wishes that he could some day waylay and trap an old man with a beautiful bushy beard, as appears in the photographic annuals. Perhaps he wishes that he could find some hard boiled virago, a sinister Apache, a derelict from the back alley, or some horrid, haunting monster from an unknown world.

With makeup it is possible to bring nearly all of these people to the studio. To do this it is necessary for the photographer to obtain a supply of nose putty, toupe paste, black wax for blocking out teeth, and, perhaps, crepe hair, and spirit gum. It is usually not advisable for the amateur to waste much time attempting to make crepe hair beards and mustaches. Crepe hair is extremely difficult to handle without a good deal of practice and is best avoided. Nose putty, lining color and the dermatographic pencil, however, will do wonders in character development.

The first thing that the experimenter in these fields should do is to learn to control the age of his subject by the proper placing of wrinkles. As time lays his chill hand upon us we find horizontal wrinkles forming across the brow, a deepening of the frown wrinkles between the eyes, a bagging beneath the eyes, the formation and deepening of parenthetical wrinkles from the corners of the nose around the mouth.

Besides a bagging of the eyes, crow's-feet form at the corners. By adding wrinkles of this sort, years may be piled upon a young person. Observe Fig. 3. Here we have our same model once again with a flat front lighting. This time it is placed low in order to throw unflattering shadows above the collar bone. Horizontal wrinkles are placed across the forehead, the eyes are somewhat bagged, lines are drawn from the corners of the nose down to the corners of the mouth.

Extreme age is characterized not only by wrinkles but by the fact that the flesh begins to fall away and the hollow parts of the skull and bony structure of the head are accentuated. In Fig. 5 these hollows are made to appear by applying lining color on the cheeks and at the temples where the face normally is hollowed with age. One must be careful not to put this lining color over any place where the bony structure comes close to the surface of the skin. This brings about a misplacing of the natural hollows and alters the whole bony structure of the head.

Before applying makeup, it is well to feel with the fingers to find out where the bony structure comes near the surface and where it falls away to form hollows. When placing wrinkles it is well to have the subject raise his eyebrows, for example, to indicate where the normal horizontal wrinkles in the forehead would occur and follow these wrinkles with the dermatographic pencil, to have the subject frown and mark in his natural frown wrinkles with the pencil, or to have him smile and then trace out and engrave more deeply the natural crow's-feet or laugh wrinkles. In this way, naturalness in makeup is easily achieved.

Fig. 4 shows a character makeup of our model using toupe paste to block out the eyebrows. New ones are then penciled in rather high on the forehead. The extent to which these eyebrows have been raised can be best appreciated by comparing Fig. 4 with Fig. 2. In this case the eyes are shortened by placing a tiny vertical line at each corner of the eyes.

The front teeth are blocked out with wax according to the directions given on the box. The upper lip was well padded with rolls of cotton of the sort that dentists use when they work on one's teeth. The corners of the mouth were carried out with makeup and bags were lightly smudged in beneath the eyes with lining color.

In this case, as in the other, the base makeup was applied after the eyebrows had been blocked out with toupe paste. The liner was used under the eyes and the other makeup put on with the dermatograph pencil. The makeup was then powdered and brushed as usual, blending the complexion together and softening the wrinkles to make them look natural.

Fig. 5 and 6 shows our model as an old man. If this is compared with Fig. 2 one can see at once the length to which photographic slander can grow, and one can appreciate that if so charming a young girl can be made into such a hardened old man that almost any characterization is possible with the aid of makeup.

To make the old man, nose putty was placed on the girl's nose to give it a hawklike outline. This putty is molded between the fingers until it is soft and then pressed onto the nose. It will be found rather sticky, but if the fingers are slightly greased with cold cream the putty is easily handled and its edges may be smoothed until they blend with the skin.

A chin was added with nose putty by the same process. Ridges of putty were placed along the eyebrows building out a projecting brow and little bits of crepe hair were pushed in it to form eyebrows. This stage is shown in Fig. 5. The regular base panchromatic makeup color can be put over the nose putty, but it is usually necessary to place a little heavier layer of color on it in order to make it match the color of the skin.

After this, the wrinkles and the hollows were placed as explained previously, and small vertical lines were drawn across the lips to indicate the cracking that takes place with age. In this particular case an old wig was pulled on over the model's hair and the edge roughly smeared with toupe paste to make it stick to the forehead. Then the usual layer of powder was put on and brushed off, and the result is shown in Fig. 6.

Elementary makeup for normal portraiture can be successfully applied at the first or second attempt by any one who exercises a little care in its application. The character makeup illustrated in Figs. 3 to 6 require additional practice but very little more than for the basic makeup.

Experiences of a Model

(*Continued from page* 18)

dow dressed as I was. This brought him back to his senses, or at least frightened him, so that I was able to leave without any further difficulty.

The average man, seeing my picture beaming at him from a toothpaste advertisement, may glance at it and decide to try that brand of toothpaste, or he may not; and the average girl, seeing my sparkling smile advertising a brassiere, may think: "What an easy way to make money!" and start practicing her smile before a mirror. But neither knows what has actually gone on behind those pictures—the hours of hard work that have gone into the making of them—and neither dreams that the smiling face, which they view so casually, represents toil and concentration and sweating under clusters of powerful lights and that a dozen or more "shots" may have been taken before the photographer got the one he wanted, or the one that would please the advertiser.

As for the pay: a good model will earn $40.00 to $60.00 a week, plus expenses. The minimum rate is $5.00 for the first two hours, $2.50 for each additional hour, or $15 a day. These rates are for clothed poses. In the nude or even in semi-nude such as lingerie or bathing suit shots, the fee is higher: $5.00 the first hour and $3.00 each additional hour. A good week is ten pictures a week. Ten percent of this is paid to the Models' Registration Bureau as its commission.

My advice to any girl who wants to become a model is to register with this bureau—if she lives in the Chicago area. If she lives elsewhere, she can probably find a similar bureau in her district.

The Chicago bureau has an interesting history. It began only three years ago, when a group of Chicago models—about 100—organized a co-operative society, with headquarters in the Mallers Building. Because of their failure to pay dues and the lack of any united effort, the society was approaching disintegration, when Mrs. Seaman recognized the need of such a central clearing office for models, called a meeting of the group, discussed her plans with them, and, as a result, she reorganized the society as a straight commercial proposition and started booking models on a percentage basis.

Today, the bureau has a registry of 1700 models. And it can supply the demand of any studio for any conceivable type of model, from a babe in arms to a woman of eighty, from a Negro "mammy" to a ravishing young society girl—and it does a gross business during the rush season of $12,000 a month.

The most frequent demand at the bureau is for lovely girls and women of seventeen to thirty-five years of age. There is a lesser demand for male models from twenty-two to thirty-two. Children with posing ability are rare and are in demand.

A successful girl model must have more than merely a pretty face. She must have intelligence, personality, breeding, and she must have good taste in clothes and a flair for wearing them smartly, and, above all, she must know how to obey directions.

After she has been accepted by the bureau for registration, a girl may spend a month or so acquiring the necessary polish and ability for modeling. She will get this by watching and studying the experienced models, and by instruction from the bureau heads.

Another thing: sometimes a pretty face is deceptive—from a photographic viewpoint—and many a girl who is an exquisite beauty before her mirror is a complete flop before the camera. She simply isn't the "camera type." Sometimes, too, this works just the other way around. And that, when you come to think of it, evens everything very nicely.

Every day, girls hoping to become models call at the bureau, and each is interviewed, and, if she offers any possibility at all, a card is made out for her and filed in the index, and she is given suggestions for improving her appearance, with a different style of hairdressing, or another kind of suit or dress.

Often these suggestions, if followed intelligently, will transform a drab working girl into a stunning model.

Others need only a sinuous, symmetrical figure—nude posing, of course, requires no ability to wear clothes, but only a lovely-formed body or at least that part of it in which the photographer is interested.

One of the most successful models at the bureau is Frances Douthitt, University of Illinois co-ed. She registered in June, last year, and her striking comeliness, which photographs uncommonly well, immediately brought her a number of assignments. During January of this year working only week-ends and holidays Miss Douthitt's net income was $128.75.

For the young mother type—also in demand by many advertisers—the bureau has Mrs. Isabelle Stewart, mother of a twelve-year-old daughter. Jeanette Schriener specializes in debutante poses, while Kay Campbell and Angelita Harms are at their shapely best in abbreviated bathing suits. Jeanette's radiant face is usually seen illustrating cosmetics advertising, and exotic Helen Reese is in demand as a sleek model for smart gowns.

Finally—and most alluring of all, perhaps, to 99 girls in a hundred—is the Hollywood possibility. Movie scouts, seeking fresh talent for the screen, frequently call at the bureau, and, as a result of one of these calls, jaunty Eleanor Stuart now holds a seven-year contract with Metro-Goldwyn-Mayer, and Don Kintz, also a former model at the bureau, is now taking a screen test in Hollywood. Linda Yale, who was the lovely model used by Jack Hazlehurst in his double page picture feature for this issue, has just attracted the attention of Fox-20th Century.

No; it isn't always easy, this business of being a model, and it is never as glamorous as many girls seem to think it is, and there are times when I suffer the bitterest disappointment—as when I am sent out on approval and refused, or when there are no calls for me at all. But, usually, just as I'm beginning to feel discouraged and start asking myself if an office job wouldn't be better, after all, I get a rush call to pose, and things begin to pop and hum, and all the world is rosy again, and I feel that the best of all possible ways for a girl to make a living is in being a photographer's model.

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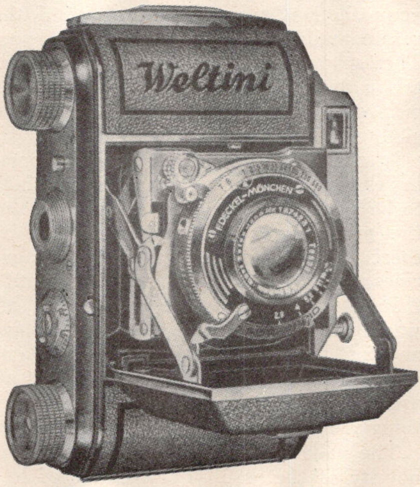

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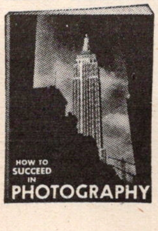

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Stopping Action

(Continued from page 20)

focus on the small camera to get a clear cut runner, too.

One of the best baseball pictures is the stolen base. For the small camera operator these can be taken only at third base or the plate. You must anticipate the play, however, and be prepared. Focus on your base or plate and wait for the action. Shoot when the player starts his slide. Usually, you get the sliding player, the base player, the umpire, a cloud of dust, perhaps a catcher's mask in the air and what not.

Football offers some difficulty for the field is large and rules prevent anyone but players and officials from being on it. Therefore, you must work the sidelines and pick your shots when the teams are in action near your territory. If you know football and can diagnose where plays are going, focus on a spot you figure will be in the center of action.

A player back to throw a forward pass with his foes rushing in to block it, makes a good picture. Another good one but mighty tough to get is a pass receiver in the air with the ball at his finger tips. A kicker is okeh or a runner as he breaks through the line of pivots to go off tackle. In all these bits of "action" there really is little movement providing you shoot at the right time. Use f4.5 or f3.5 and 1/500 for football unless the sun is unusually bright.

There are several other sports in addition to those we have discussed but these are the best ones to practice on. While "covering" a game, experiment with your stop openings and speeds. Remember, no two cameras work exactly the same and that light conditions vary.

Stop openings and exposures I have mentioned have produced excellent results for me, using a camera with an f3.5 lens and a top speed of 1/500. You machine may work best under slightly different conditions.

I have always made a habit of keeping my stop comparatively wide open and using speeds a bit faster than necessary. Thus I guarantee that the action in the picture will be stopped. Even the slightest distortion detracts from a picture's value and you should strive for sharp, clear cut negatives above everything else.

Most of us get around beaches during the summer. If you want to take action pictures of divers, open up to about f8 or f5.6 and shoot at 1/100 to 1/300. Take your picture at the top of the dive when the action is comparatively still.

It is even possible to take action at polo games with your small machine, stop f3.5 or f4.5 and speed 1/300 to 1/500. In this sport you must be patient and wait for the action to slow down. The best "angle" to shoot polo from is behind the goal posts—if you can get there.

Another source of good shots is at the start of a chukker when the referee tosses the ball in from the sidelines. Usually there is a lively mix-up for a few seconds before a player manages to hit the ball away. During the melee, action is not swift, there are plenty of horses, players and mallets jammed up and a good picture can be obtained.

So much for the outdoor shots. Some of you amateurs may be fortunate enough in having a synchronized speed gun to go with your cameras. If so, you may work indoors, too, taking boxing, wrestling and basketball action shots. It requires a lot of patience in these sports for you absolutely must wait until the action is slowed down. I have never seen fast action in the ring or on the court photographed without distortion and that is what we must avoid if possible.

For your boxing and wrestling, use stop f8 and 1/100, one medium flash bulb. If you are close to the ring, focus on the ring lights and then forget about that end of things. No matter where your subjects move in the ring they will be in focus for you have lots of depth at stop f8.

In boxing the best shots are knockdowns, blows landing and the referee pulling the fighters out of a bad clinch. Wrestling offers so many thrilling highlights there is none better than the other.

One thing about wrestling is the facial expressions of the athletes when they are being punished by a foe. Horrible grimaces, such as the one shown in the wrestling picture with this story, are the sort to look for.

Take your place as close to one of the baskets as possible at a basketball game. Shoot about f5.6 and 1/100. Wait until the players are jumping for a free ball that is rolling around the basket. Then take your shot. Or you may wait until the referee calls a jump ball in front of you. Then snap your picture when both jumpers are in the air. That is always good. Remember, however, to have the ball in the picture. Otherwise it's no good.

In addition to action pictures of sporting events, there are always the posed shots to be considered both by the amateur and the professional. A greater number of these are used by newspapers and magazines than the actual action of a contest.

In the posed attempts you should always get a good picture. You don't have any fast action to stop and you can focus on your subject instead of picking out an area and setting your stop so that everything within it will be in good focus.

The value of the still picture is in the novelty of the pose. For pictures of ball players swinging a bat, kneel down and shoot up. Get on top of something and shoot down on a golfer swinging his club. Tilt your camera slightly and take a picture of a football player carrying a ball. The finished product will look as if the player is running at a dizzy angle and the action value is much better.

Have a football player go through the motion of kicking a ball and have him leap off the ground as he does it. Speed of 1/500 will stop this action easily. For a football passing picture, have the player hold the ball back and jump into the air. Players probably don't do this in actual play, but the pictures you get will have it all over the humdrum shots of athletes with their feet planted on the ground. Any picture of an athlete in the air has action value.

The life of a sports photographer is one of never-ending thrills. I can truthfully say that I learned more about the "inside" of sports from photographing them for a year than I acquired in five years as a sports writer.

Your viewpoint of a contest from the press box is narrowed to what you see. When you are down on the field taking pictures you hear what the players say and notice mannerisms, not apparent to the scribe in the stands.

Even if you are an amateur you will find most professional athletes willing to give you a "break." One of my big thrills was "covering" the national open golf tournament at Oakmont, Pa., in 1935. Paul Runyan, one of the best of the professionals, actually stopped his game and posed for me on the fairway while a huge gallery waited. At that time I was just a cub at taking pictures with no newspaper experience at all.

Another unusual experience was photographing a wrestling match in which Billy Thom, junior middleweight champion, was defending his title. Noticing the flash of my bulbs at the ringside, Thom several times worked himself and his opponent into unusual poses and then shouted for me to "shoot it now."

The career of a sports photographer is sometimes fraught with danger, providing the individual takes his work seriously. No editor asks his cameraman to take unnecessary risks for the sake of his art, but no editor wants a photographer who will not get into the middle of things if by so doing he brings home the bacon.

One of the few shortcomings of the miniature speed camera is the necessity for being literally "on top" of the subject. This often entails working in a dangerous territory. In my own experience are such close calls as being run over by a polo pony, knocked down by a football player, fallen on by a wrestler and being dumped in a river attempting to photograph speed boat action while squatting on the nose of a speedster doing a good 30 miles an hour in rough water.

But these are all in a day's work and bother the veteran no more than wet feet bother a salesman or wet clothes an iceman.

In the long run, when you begin taking sports pictures, you are starting a hobby that should never fail to keep you interested. Snapshots and scenic stuff get mighty boresome after awhile, but the athletic field knows never a dull moment.

Coming! **Experiences with a Leica. The story of Tom McAvoy, premier candid camera artist for Life and Time by V. G. Ten Eyck.**

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Photoflood Unit

(*Continued from page* 14)

as possible. Mount the third socket in the center of the upper side. Turn the pan around and mount the switch on the back, near the top, and wire it according to the accompanying diagram. Cut two pieces of thin wood, preferably 5/16-in. three-ply veneer paneling, so that they are shaped like the letter P with the hole filled up. The circular part is cut on a radius that will produce an arc equal to that described by a point near the base of the switch handle. Cut two pieces of tinplate or other sheet metal and two like pieces of cardboard so that, when mounted on the curved edges with small nails, they will form a guard over the live parts of the switch. Leave a slot for the switch handle, and place the cardboard beneath the metal, to form an insulating layer, in event of accidental bending. The projecting parts of the wood pieces serve to stiffen the back of the reflector.

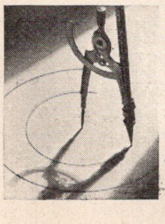
The lamp is attached to the tubular standard by means of a hardwood block. This is circular in shape, with a section removed; and has a number of holes bored radially about its edge, into which the stand tube slips. The block has a diameter of 3 in. and a thickness of 1½ in. Holes are arranged so that the lamp can be mounted to cast its beams upward, horizontally or downward.

Attach the lamp cord and, if you desire, add a metal cap to the upper socket to improve its appearance, and your photoflood unit is ready to use. When the switch handle is down, the two lower lamps burn in series, having at this brilliancy a life of perhaps 1000 hours. With the handle up, all three lamps burn at full brilliancy. To turn the lamps off, move the handle to the halfway position.

With the two lower lamps burning at maximum brilliancy, exposures of objects from 2 to 3 ft. from the lighting unit can be made at 1/25 second at a lens opening of f8, using extra-fast panchromatic film. When using amateur cameras with Verichrome, Plenachrome or similar roll film or packs, it is advisable, for first trials, to employ three lamps, with the lens set at or near the largest opening, and with a shutter speed not in excess of 1/25 second. For home motion picture cameras, panchromatic film is preferable, used with a fairly large lens opening.

Two of these units built as outlined above will supply sufficient light for taking rapid exposures of large home groups or will enable you to take home movies without an ultra-fast lens. Depending on the distance of lights to subject, movie exposures can be taken at from f 5.6 to f 8, adding much depth of focus and sharpness to the pictures.

END



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Fish Photos

(*Continued from page* 46)

forward: a single bulb from the side will give a hopelessly uneven lighting. The whole story here is to fiddle around with a couple of photofloods or even ordinary mazdas until you can see exactly which angles illuminate every portion of the tank.

Your camera will also have to be moved back considerably because now you've got to get sharp focus over a plane of 18 to 24 inches or more, whereas with the single fish all you needed was an inch. This, in itself won't alter your exposure time because here the important factor is the distance from light to subject, not from camera to subject. Hence, with two bulbs instead of one you can close down the diaphragm one more stop, other things being equal.

Speaking of foliage, it might be well to suggest that a plant or two be used even in the small tank where single fishes or pairs are being recorded. Vallisneria or Sagittaria are common types of "tape grass" used for fishes tanks, and a bunch of either of these graceful plants will give a little atmosphere that will not be amiss provided you put it up front where it will be in focus instead of in the back, where it is usually planted.

As for the darkroom end there is little to be said beyond the fact that a fairly fine grain developer recommends itself because most of the images are so small. Those Grunts shown in the accompanying illustration for example, are each about a foot long in life, but on that particular negative the two principal actors measure less than three-quarters of an inch.

That may seem to be a wasteful way to use a 4x5 plate but, sadly enough, fishes in exhibition tanks rarely pose where you want them to! So you take what you get. For that reason I always used the Wellington Borax formula for tank development because it gives a nice, delicate negative. So do Rodinal and that group, but they take longer. I can't be bothered waiting 25 minutes to find out whether the evening's work has been a flop or not when you can know the worst in 6 minutes!

The picture of the Grunts, incidentally, was made at the New York Aquarium in one of the gallery tanks which are six feet deep. The main floor tanks are ten feet deep or more (that is, from front to back) and in this sort of work there are two problems to face: penetration of the light and waiting for the fish to come within range.

Again, the best position for the light is above the water, but frequently you have to shoot through the glass. And while I have made many shots at f8 with one flash bulb, it is much safer to use two or even three bulbs for the big tanks because you've got a lot of water to contend with and water does scatter light.

Allowing for the great differences in distances, the same principles apply here which have already been outlined for small tank work. The chances are that relatively few photographers will have occasion to work in a public aquarium because there aren't many to work in.

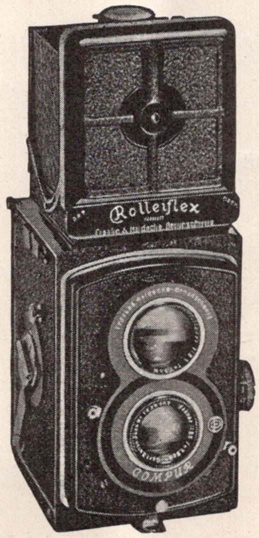
In the big tanks you've got to focus on a spot and wait for the fishes to get there. And when I tell you that I waited three hours for those two Grunts to start jawing each other somewhere within focal range, the basic idea becomes self-evident.

To be sure, they're not all as tough as that or I'd have quit long ago. But there are enough exasperating ones to add a zest to the game which makes it intriguing. Before very long you realize that all of the fishes that were basking up front when you opened your camera are now lurking behind shells and marine plants, laughing uproariously as you stand on one foot and then the other, wondering what became of them.

Coming! **Another article by Paul Kearney on Photographing Pets.**

R O L L E I F L E X

An Investment In Pleasure



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R O L L E I C O R D

Questions and Answers

(*Continued from page* 14)

These figures are based upon a lens having a 2-inch focal length which is the case with your camera. If the diaphragm is opened wider than f11, say to f8, then the range of sharp focus will be considerably reduced and the objects in the foreground, closer than 15-feet may be somewhat out of focus and indistinct.

B.D.McC., Mobile, Ala. I have just purchased a new camera which acts in a very peculiar manner and many visits to camera repairmen have failed to reveal the cause of the difficulty. One day it will be out of focus on all objects farther than 50-feet and on another day, it will be sharp at infinity but out of focus on objects in the foreground.

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At first we thought that the lens was loose in the mounting or that the mount was loose in the front board, but trial proved that this was not the case. We then tested out the struts but they were staunch and rigid without a sign of loose parts. Where do you think the trouble lies?

Answer. In a similar case with a miniature camera of the same type, we spent a great deal of time running down the trouble. We kept at it, however, until we found that the trouble was caused by weak springs under the pressure plate, the tension on the plate being too weak to hold the film flat down on the film track. This may be the cause of your difficulty.

A.A.F., Omaha, Nebr. How are the very large murals made? With such a great enlargement, I should think that there would be trouble with the grain but such does not seem to be the case.

Answer. One method commonly employed for suppressing the grain on such tremendous enlargements is to make a new larger negative from the original and then enlarge this to the required size. By this double exposure method, the grains of two films are "staggered" with one another so that there is very little evidence of grain.

K.F.A., Hampton, Va. Will you please give me a brief description of the gum-bichromate process of printing? I have seen a number of these prints and they are beautiful.

Answer. Making gum-bichromate prints is a tough process for the beginner and is quite different from making other kinds of prints. The emulsion is made at home and the whole thing, for that matter, is a homemade job including the coating of the paper.

Some finely powdered pigment, of the desired color, is mixed with a solution of gelatine in water. This is then mixed with a bichromate of potash solution for sensitizing, and then the fluid is applied to the paper sheets to form the light sensitive emulsion. The negative is then printed on the emulsion, or projected upon it by an enlarger, in the ordinary way.

After washing in water to remove the gelatine not affected by the light, a second piece of paper ("the backing") is then pasted down tight on the emulsion and allowed to stay until the emulsion adheres to the second piece so tightly that it will be drawn away with it when the sheets of paper are separated.

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The film is now reversed so that the bottom of the emulsion is now on top. It is carefully washed with water to remove the excess unaffected gelatine and the print is complete. The result is not really a photographic print but a picture drawn in pigments traced upon the surface of the paper.

L.L.K., Boston, Mass. When using an exposure meter, my f6.3 hand camera proves to be just as fast as my f4.5 camera. The results are almost identical so far as the film density is concerned when both cameras are wide open. Why should this be?

Answer. This suggests that the shutter speeds are not correct, the f4.5 shutter being too fast or the f6.3 shutter too slow, or both. Again, the diaphragm adjustments may be incorrect. These misadjustments can be easily corrected by an experienced camera man. Modern films have so much latitude in permissible exposure time that when the light is strong enough to give you a full exposure at f6.3, opening up to f4.5 may still give you a printable negative, even though twice as much light has been admitted.

Photo-Murals

(*Continued from page* 22)

size of the photographic prints. (Fig. 3, center.) This gives the complete design.

Sometimes one print is used in the exact center of the shade. Sometimes two prints are used on either side of the shade and an outlined panel is placed in the center. Again a complete scene can be enlarged to fit the cardboard and a scenic shade will be the result. Once the plan of decoration is decided upon, the next step is to make an enlargement to fit the space outlined on the cardboard.

When you have the print the correct size, paste it directly on the space marked for it on your cardboard drawing. (Fig. 3, bottom.) The next step is to photograph the cardboard shade. By doing this you secure a complete picture free from any blemishes or bumps.

The final step is to print this pictured lamp shade on the translite paper or whatever sensitized paper you have decided upon. Once the shade is printed and tinted, if desired, all that is left to be done is to fasten it to the wire frame and bind the edges with a fine molding.

Any and all forms of individual home decoration are feasible and practical for the enlargement enthusiast. New uses will constantly occur to him as he begins to experiment in this fascinating field. In fact one group of women are at present arranging to have vases of flowers photographed, enlarged and printed on material to be embroidered and used for scarfs, pillow cases, etc. Try some angle of your own, and put your enlarger to a new use.

END

OUR NEXT ISSUE

This first issue of Popular Photography was released on the newsstands slightly ahead of schedule. The next issue (June) will appear on all newsstands on or before May 25th. Watch for it!

Trade Notes

(*Continued from page* 58)

tax, Contaflex, and a complete line of Zeiss Ikon cameras and accessories.

* * *

WE have read with considerable interest "Better Photography Made Easy," recently released by Agfa Ansco Corp., Binghamton, New York. This attractive spiral bound book of 60 pages is chock full of hints on picture taking and camera operation. It is especially well illustrated, showing both the wrong and right way of taking pictures. Quite a few lighting diagrams are included, and all in all it is a very fine and understandable presentation of a technical subject written in a non-technical manner. Available at 25c by writing to the Agfa factory.

* * *

PHOTOGRAPHERS interested in color photography will find helpful and instructive a new booklet by Rowland S. Potter, Vice-President and Technical Director of Defender Photo Supply Co., Rochester, New York. This is called "Methods of Making Three Color Separation Negatives," and describes all common methods of making separation negatives, information concerning several new American made "one shot" color cameras, amplified by construction diagrams. In addition, there is some new information about separation negatives from screen plates, Du-pac, and Tri-pac.

We have also received a new edition of the Chromatone book put out by this same concern. It has been considerably amplified and brought up to date, and is now in its fourth edition. We have always felt that this book is a real contribution to information on color photography, as it is written in a language that any photographer can understand. This book is available at 25c.

END

Exposure Chart

(*Continued from page* 56)

camera and the focusing conditions call for a stop of f-8. What will the shutter speed be?

SOLUTION. The conditions referred to Table No. 1 indicate a light factor of 4.0. Transferring this factor to Table No. 2 shows that Verichrome has a Weston Number of 16; hence with a light factor of 4.0 and a Weston Number of 16, the table shows that the exposure with f-11 is 1/50 second.

In the table of Aperture Factors we find that an opening of f-8 gives a factor of 2.0, which when multiplied by the denominator of the speed gives an exposure of: $\frac{1}{2 \times 50} = 1/100$ second exposure speed.

The light factor varies considerably with the month of the year. In May, under the above conditions, the factor is 4.0 but in January it was 6.0 and in June and July it will be 3.0. This is due to the fact that the sun is down low near the horizon in the winter and is high in the heavens in June and July.

Portable Enlarger

(*Continued from page* 55)

on both sides in a shaded manner, using a coarse abrasive at the center and shading to a finer grind along the edges. It is thus possible to get an even diffusion of light in close proximity to the bulb, eliminating the usual long housing.

Unless suitable light-proof ventilation is provided, excessive heat will cause the whole interior of the enlarger to "sweat" and beads of moisture are apt to gather on the negative glass, being plainly visible in the finished prints. For this reason brass ventilating disks are provided, as shown in the drawing, when the light socket is attached. The use of a conventional 110 volt socket switch in the 220 volt housing makes ample room for this installation.

Three pine boards of three-fourths inch thickness are cut and screwed together to form a mounting for the finished projector. Details are given for the shape and size of these pieces, the two smaller ones being exactly alike, and the machine is attached to this mounting with four small screws.

A demountable stand of ordinary gas pipe and flange, the latter being screwed to a suitable base board, completes the ensemble. Metal pipe straps are used to connect the projector and mounting to the stand. Due to the arrangement of weight in this design, the projector will stay at any desired height if these straps are adjusted to a reasonably firm sliding fit.

Throughout the construction of the enlarger, wood pieces are joined with screws of a suitable size and head and bolts connect metal parts. All metal clips, fasteners and straps are made of spring brass and drilled as indicated for the screws with which they are attached to the machine. The lamp housing should fit tightly over its plywood cover but should not be permanently fastened to same, as it is necessary to change light bulbs occasionally.

The novice who seeks good results in photo enlarging should remember that light leaks, however small, may result in fogged pictures and that any jarring or movement of the projector is fatal to the print. Properly built and carefully handled, the portable enlarger will produce fine pictures and provide its owner with genuine entertainment and profit.

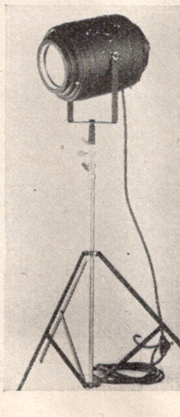
Coming! **Complete details on a home-built combination enlarging, titling and copying stand.**

Human Interest

(*Continued from page* 46)

doesn't matter whether the brick pavement is a garden walk, a terrace, or a solarium. We are instantly reminded of the things that men do in spring.

The other illustration shows two styles of shoes such as older men might wear, grouped with a blue-print, six-foot rule and tape measure similar to those used by contractors and architects. The setting suggests the presence of someone. It may be the contractor, the architect or the owner. Our imagination is aroused. Again we are reminded of Spring.



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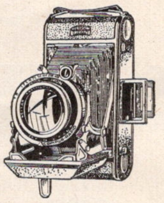

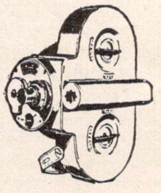

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How Not to Join a Camera Club

(*Continued from page* 12)

out of every five has it, and in even the smallest gathering some thoughtless and inconsiderate person is apt to start talking about the latest f1 lens and focal plane shutter. Unless a person has exceptional sales resistance, disastrous results are almost inevitable.

Statistics show that the home also is a very dangerous place to stay. Photographic neighbors have the habit of dropping in to show their latest purchase; and even in the solitude of an apartment house, the virus can be transmitted from husband to wife and, not uncommonly, vice versa.

Reading should be undertaken with circumspection and confined as much as possible to Dun and Bradstreet or the Congressional Record. Photographic manufacturers are no respecters of persons and insidious advertisements are encountered in the most unexpected places.

But the greatest hazards of all are the insidious Camera Clubs. These organizations flourish in every clime and every land; addicts are numbered by the thousands. And nowhere is the photographic germ more virulent. It is possible to avoid becoming a member, but eternal vigilance is the price of liberty.

On the face of it, the simplest preventive measure would seem to be that of isolation. Castaways on desert islands and mouse trap hermits in the primeval wilderness are relatively safe, but even so, when two or three are gathered together about a roll of films or a snapshot album, a club is apt to spring into existence.

Unfortunately, desert islands and primeval wildernesses are in these days usually laid out into subdivisions or golf clubs, so that the most obvious prophylactic is not always available. But with restraint and self control, it is often possible for the camera addict to keep out of clubs and to pass them with averted eyes. If, however, the threshhold is passed, the temptation to join becomes as strong as the siren songs that drove Ulysses into a strait jacket.

The good fellowship, the fine prints that adorn the walls, the fascinating equipment that is always in evidence, are impossible to ignore and hard to resist, and many rabid fans blame their downfall on a casual visit to one of these tempting places.

Art galleries too are often but stepping stones to Camera Clubs and should be shunned.

It is of course always inadvisable to ask for competent opinions and advice. Now and then a critic will break the age old rule and tell the hideous truth. Stick to ancient processes and avoid all things new, the path of progress leads but to a Club.

Buy neither photographic magazines nor annuals. Refuse to permit POPULAR PHOTOGRAPHY in your home. The beautiful prints that adorn their pages may wreak all sorts of havoc.

Stick to the credo that a flash light is as bright as a flood light, even if it is hard to keep the batteries charged.

If all these measures fail and the victim finds himself drawn helplessly towards the Club, then either quit the game at once and take up quoits, or else stop reading articles like this.

[The author, Vic Johnson, must be badly infected with the photographic virus. He is V.-P. of the Fort Dearborn Camera Club and one of its most active members for nearly five years.—Ed.]

END

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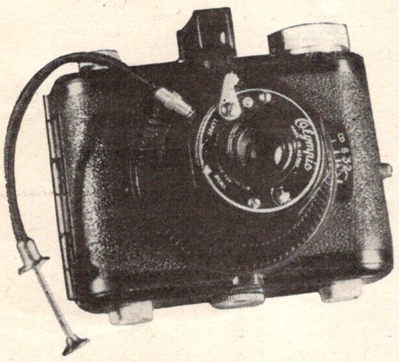

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Camera Club Notes

(*Continued from page* 58)

practice of creative photography as an art. Officers are: Pres., Dr. Max Thorek, of Chicago, Illinois; Sec. and Treas., Byron H. Chatto, Pittsburgh, Pa.

The next meeting of the P. S. A. will be held in Chicago, in the Fort Dearborn Camera Club rooms, 75 East Wacker Drive, in October, 1937.

There will be a member show at the Art Institute in October of this year.

RADIO CAMERA CLUB OF CHICAGO. Composed of radio actors, singers, and employees of NBC and Chicago radio stations. Now in its third year. Meets weekly. Now planning its second annual exhibition, to be held in the Merchandise Mart.

The group chiefly interested in miniature photography was founded three years ago by Willis Cooper, then NBC Central division continuity editor; Don Briggs, actor; Art Jacobson, actor, and Ted Sherdeman, director. All of these now are in Hollywood in the movies, and have organized the Breakaway Camera Club, the name symbolic of their departure from Chicago.

END

Pictures Without a Camera

(*Continued from page* 13)

over the exposed sensitized paper and turned on the light ray. I gave this a ten second exposure and later development showed that the bottom of the whiskey tumbler had given the required shading effects.

Now I switched to my red light and removed the sensitized paper from the envelope. On the bottom lower edge of the paper—sensitized side up, I placed some tinsel, resembling undersea vegetation. Other sprigs were held in readiness.

Then I turned on the flashlight for ten seconds. The tinsel on the lower edge was kept in its position for all of that time so that it would be burned-in deeply. Meanwhile, I placed a sprig of tinsel on the paper for six seconds, and another for two seconds.

When the picture was developed the effect of this action was to make the ten second tinsel appear to be in the foreground, the six second tinsel to be in the medium background and the two second tinsel to show faintly as background. Thus we can achieve a three dimensional effect in light ray photography simply by varying degrees of timing.

Paper cutouts of mountains, trees, houses, and a wide variety of shapes offer an infinite variety of possibilities.

Just how far you can get with light-ray photography is entirely up to you. It seems to me, however, that a lot of things can be done with it, varying from the making of your own unique greeting cards to imaginative creations in the realm of advertising photography.

Coming! **Shooting the News in Color, another article by E. C. Schnurmacher.**

Microphotography

(Continued from page 12)

put a collar of black paper around my camera lens so that the collar will surround both the camera lens and the eye piece of the microscope. This is done merely to prevent any stray light from getting between the two and perhaps fogging the picture.

Now that seems mighty easy, and it is, but if it weren't any more complicated than that, it wouldn't be any fun. Here are some of the complicated things to be done.

First, of course, you've got to pose your subject. If you're shooting a picture of a piece of cloth, that's pretty easy because all parts of the cloth are about the same. But remember, if you're using a microscope that enlarges about 100 times, then the area you're photographing is about pin-head size. The area which my microscope takes in at 120 times magnification is only one-sixteenth of an inch in diameter.

Now, if your object is a needle point or grain of sand, it must be in exactly the right spot in front of the microscope to show at all. The way I find that spot is to put my light in front of the eye-piece. It then shines a tiny spot of light at the other end of the microscope and where that light hits is the right spot to "pose" my subject. Sometimes I place my subject between two pieces of glass to hold it in position; sometimes I fasten it to a piece of white or black paper, or even to cloth.

I usually put white paper in back of a dark object or black paper in back of a light object to get needed contrast. Sometimes, if the subject is quite thin and shows a good picture that way, I photograph through it—that is, I place it directly on the glass and put a light in back of it.

Next, the lighting is important. I use just one 60 watt bulb, but almost any strong light is good as long as it lights up the spot you're photographing fully. You'll find that shifting the light around until you get it in the best position will make the difference between a good and a poor picture.

For example, if a steel object is to be photographed and you want to show the grain of the steel, you need strong lights and shadows to bring out the detail or you'll get a flat uninteresting picture. So move the light, raise or lower it until you get the best effect. And remember, while you're doing all this, you'll have to be squinting through the microscope because that's the only way you can see what you're posing.

Next, there's the matter of focus. Microscopes ordinarily—at least, the inexpensive kind (I'm not sure of the others)—have very little depth of focus. You'll find that unless the article is quite flat, and that means almost paper-thin, you'll have trouble getting everything in sharp focus. I find that while I can get the top of a grain of salt in sharp focus, the bottom may not be in focus, and vice versa.

That being the nature of microscopes, you've got to decide on just what portion of your subject you want to bring out, and sharpen your focus on that. Even in shooting thin silk, I find I can focus the top fibres sharply, but can't sharpen up those very much below the top surface at the same time.

Microscopes with high power have less depth of focus than those of low power. If you want a relatively thick article to be in sharp focus, try using a microscope of less power, and then make an enlargement from the smaller negative made this way.

Now the matter of exposure. That's something you'll have to determine by experiment and experience. My own exposures have run from 7½ to 15 minutes. The amount of exposure will vary, depending on the kind of microscope and light you use. I've used only panchromatic film and I'm not sure what the right exposure might be with other types.

When the object is quite light or has a lot of reflections, such as in photographing the teeth of a nail file or the edge of a razor blade, I generally give a 7½ or 8 minute exposure. If the object is darker, I lengthen the exposure. This type of photography is so slow, anyway, that I haven't been able to tell much difference between two negatives of the same object when one had as much as two minutes longer exposure than the other.

My theory about this kind of microphotography is that it is something like photographic enlargement printing—the image is projected through the microscope, then through the camera to the film. I think I'm right because I've even removed the camera lens completely and was still able to get as good a picture as with the lens.

Would you like to have a try at this fascinating photography? Well, here's how to start. Get hold of a small inexpensive microscope. You can get them very reasonably at camera or optical stores. You don't need anything elaborate. Any kind that will enlarge about 50 or 100 times will do. The toy stores even sell small micro sets that are plenty good for your purpose.

It doesn't make any difference what kind of camera you have. If it has a ground glass, that's fine. You can proceed as I've outlined above. If it hasn't a ground glass but has a removable back, you can take off the back and place a piece of semi opaque tissue paper over the back to serve as a ground glass. Remember, though, that your ground glass is only for your original experimenting to find out where and how to place your camera. After you've determined that, just mark the spot and always place the camera exactly there. And remember, also, that you'll only be able to see an enlarged picture on the ground glass if you put a strong light directly in back of some *very* transparent object at the end of the microscope.

If you have a box-type camera or one without a removable back, it may take a little more experimenting, but you'll eventually get the same result. Simply put your camera lens up close to the microscope eyepiece after the microscope has been focused and try a few exposures.

I can't tell you much about building your equipment or stand for the microscope. My own is so crude that I'm sure anyone with a yen for making things could do better. I will give this one caution, though. Watch out for vibration.

Remember that if you're enlarging an object 100 times and that object vibrates 1/100th of an inch, your picture will show what is equal to a one-inch vibration or movement on the negative.

As far as finding things to photograph, that's the easiest thing of all. Almost anything around the house is good to try—plant leaves, salt grains, thread, human hair. And with Summer coming, how about the fly wings and mosquito stingers, and all the outdoor plant life?

END

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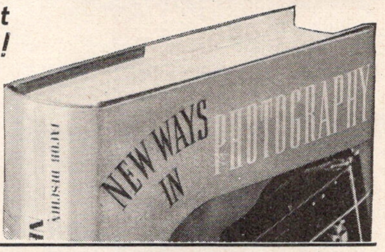

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Posing Your Subject

(*Continued from page* 10)

the subject's head, the lens being on a level with her mouth. For the main source of light, I used the third standard with one Photoflood lamp; this light was placed four feet from and directly facing her profile, the pan reflector being elevated so as to be just out of the field of the lens.

Reviewing the set-up we have: first, a white background independently illuminated and placed five or six feet in back of the model. Next, the model seated on a bench with her profile toward the camera. Third, the light by which she was to be photographed was spotted four feet from her on a level with her head thus illuminating her profile with a broad flood of light, and finally the camera placed five feet from the subject bringing into alignment the model's head, the front light and the lens.

This type of lighting, erroneously called a "flat" lighting, produces modeling by the light rays losing strength and value as they strike the various planes of the head. The points nearest the light receive the strongest illumination, such as the nose, forehead, cheekbone and chin.

The center portion of the hair receives a fair amount of light while all points beyond gradually diminish in luminosity and by this very losing of values delicate modeling is produced. We now see how there really are no shadows, the relative contours being produced by virtue of the diminishing half tones.

There is one other characteristic peculiar to this lighting layout. The model light being closer to the subject than the camera illuminates a lesser area than what the "eye" of the camera sees with the result that the camera not only records the lighted area but goes beyond and picks up and registers, as a definite dark outline, that portion of the subject not reached by the front direct or the back reflected light.

At least ninety percent of my pictorial nudes are made with this form of lighting, that is: the model, light and camera in alignment, with the light in all cases being from one to three feet nearer the model than the camera.

The lens (50mm. Zeiss Tessar), was stopped to f8, f9 and f11 respectively, and a half second exposure at each of these apertures was made using fine grain panchromatic film (Scheiner 18 speed). The cable release was used in making the exposure thus eliminating any possible camera vibration.

The negative was processed in Formula JP-4 (for formula, see end of this article) at a temperature of 65° F., ninety minutes time. Right here, let me state that *all negatives* are first immersed in tap water for a period of two minutes before being placed into the developing solution.

The film, after fixing and washing, is wiped with a grit free and quite damp chamois leather to remove surplus moisture and prevent water rings from forming during the drying process, and is then stretched horizontally to dry in a well ventilated dust free room. Rapid drying, prolonged development in a fine grain nonalkaline developer and minimum of exposure on any film will give the finest grain possible from that particular type of film.

Projection prints (2¾" x 3½") were made from the three exposures of Miss Hanner, the print showing the greatest range of half-tones was decided on for the finished portrait. Referring to Fig. 5, it will be seen how the inharmonious tone of the dress detracts and irritates the eye with its violent vibration; the broken line of the jaw caused by the sagging flesh and the droop of the shoulder gives the appearance of deformity and are objectionable features that must be corrected.

I had my choice of two methods to work in: bromoil or paper negative and decided on the latter.

A straight enlargement was made on Defender Veltura F, size 11" by 14", without any attempt at control except to stop the lens to f8 and allowing only sufficient exposure to permit five minute development in Formula JP-2. To ascertain the correct exposure I would suggest using test strips from the same batch-number papers as that to be used for full sized enlargements. The final print was made on Defender Velour Black 1, using the paper negative process. Compare Figs. 4 and 5.

JP-2—FOR PAPER NEGATIVES

Water	64 ounces
Elon	300 grains
Sodium Sulphite (anhydrous)	4 ounces
Hydroquinone	270 grains
Sodium Carbonate (anhydrous)	3 ounces
Potassium Bromide	120 grains
Water to make	1 gallon

For use, take 4 ounces of stock solution, and add 16 ounces of water. Developing time, not less than five minutes. Temperature, 65° to 68° F.

JP-4—FINE GRAIN DEVELOPER FOR MINIATURE NEGATIVES

Elon	75 grains
Hydroquinone	150 grains
Sodium Sulphite (desiccated)	7 ounces
Borax (Twenty Mule Team Brand)	70 grains
Boric Acid (Crystal form)	420 grains
Water	64 ounces

Use full strength. Developing time 1½ hours when fresh. As developer ages, time may be increased up to 2 or 3 hours without danger of fog. Temperature 65° to 68° F. This developer keeps well. The used developer may be poured right back into the bottle containing the fresh and this procedure repeated until the developer is finally exhausted.

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News Photography

(*Continued from page* 8)

of this outfit. The camera, in order to be in perfect readiness, required that a holder should be in the camera with the slide drawn, also the focal-plane shutter had to be open and the front lens shutter adjusted to the proper speed with lever set for action. Besides this, the synchronizer had to be firmly secured and connected to the batteries, while the flash-bulb was inserted firmly in the lamp holder.

These operations seem intricate, but a seasoned photographer accomplishes all of them in a few seconds. But the most disturbing and difficult part in obtaining this picture was fighting the crowd to get close enough to obtain the right shot.

Many things could have happened in Schulman's dash through the mob. His synchronizer could have fallen out of adjustment or his bulb may have accidentally gone off in the confusion. But with a firmness and determination, Schulman pushed his way through the battling throng and made his picture showing Cermak a few seconds after he had been shot.

Once again, the experienced eye for news serves as the proper timing device. When, because of conditions, only one picture is obtainable, the cameraman, more than ever, depends on his timing. In circumstances such as those attending an attempted assassination, the photographer's work is interfered with by the crowds, official and unofficial, all of which make his task difficult.

The next logical step is to photograph the would-be assassin and others directly and indirectly identified with the crime. When all photographs have been made, the photographer must be quick to return to the city room to give the editor an opportunity to make whatever arrangements are necessary for their publication. It is not always an easy matter to beat a hasty retreat from such a scene and reach quick transportation back to the office. Sometimes, because of crowds, this requires more ingenuity than reaching it.

Today, coverage of all major assignments is planned very thoroughly. Transportation and wire service for speeding photographs from the field to the paper are carefully mapped in advance. Planes, automobiles, motorcycles, and in some instances the mechanism for the electrical transmission of pictures are provided for the photographer to insure speedy delivery and publication.

A contrast between the difficulties a cameraman encountered in the early days and the comparative easy time he has of it today is offered by the Gould-Decies wedding. This was the outstanding social event of its time, and full coverage was the objective of every city editor. Cameramen in those days were not particularly welcome at such social events, a fact that only increased their zest for outwitting those who barred them.

In this particular instance, the point of concentration was the church where the ceremony was to be performed. The respective residences of the bride and groom had been covered but with indifferent results. The last stand, and the one at which the most effective pictures could be obtained, was the church.

To make matters more difficult, the sidewalk approaches to the church had been completely covered by canopies for the privacy and protection of the wedding guests. Speedflash synchronizers were unknown, the photographer being required to depend on magnesium powder and the old-fashioned lamp for firing it.

Because of the restrictions surrounding their operations, comparatively few pictures of the wedding were made, considering the number of cameramen assigned to cover it. Consequently, they pooled their exposures so that the various papers represented had about an equal coverage.

Their greatest handicap was the short distance between the curb and the church entrance. This being covered, with only the customary sidewalk opening for pedestrians, gave the photographers very little operating room. As many as possible for effective work crawled into this small opening and there shot practically all the worth-while pictures that were obtained.

A further technical drawback was the slowness of both lenses and plates. But even under these adverse conditions and with this antiquated equipment they achieved what was then thought to be good coverage of an important story.

A good news cameraman will always get the most out of a story, irrespective of obstacles, natural, technical or human. That is what makes him a good cameraman.

Coming! An authentic and highly instructive article on Photographing Birds by T. R. Kent, ARPS.

Photo Markets

(*Continued from page* 44)

kingdom, strange occupations and customs; Home Desirable, Room 763, 221 N. La Salle St., Chicago, $3 to $5 for "before" and "after" photos of home modernization, especially those embracing plumbing and heating improvements; Horticulture, 300 Massachusetts Ave., Boston, Mass., $1 to $3, garden flowers, fruits, vegetables, garden ornaments and tools; Hostess Magazine, 1221 Beaufait St., Detroit, Mich., as high as $10 for professional photos of table arrangements and foods, with ice cream predominant; House and Garden at 420 Lexington Ave., New York and House Beautiful, 572 Madison Ave., New York want photos of beautiful interiors and exteriors, decorations, antiques, art collections, etc.; Mademoiselle, 1270 Sixth Avenue, New York, call for "snow scenes, beach, travels, etc.," paying $1 to $10.00 for 8x10 prints; Parents Magazine, 9 East 10th Street, New York, pay $3.00 and up for excellent child subjects; Perfect Home, c/o French Stamats, Inc., Cedar Rapids, Iowa, $2 to $10 for home construction, home improvements with "before" and "after" photos, plumbing, heating, recreational rooms, gardens, landscaping, etc.

Verily, the camera fan seeking a photographic objective will find his or her answer in selling the photo markets.

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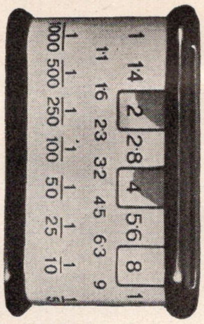

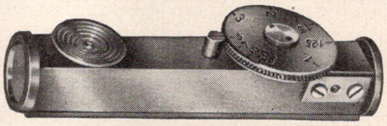

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Common Errors in Home Movies

(*Continued from page* 32)

films for camera technique, and you'll be surprised at the relative footage devoted to close-ups.

Incidentally, the amateur can learn much through study of the professional's camera technique. So skillfully is the professional film produced, however, that we are often unconscious of the medium of portrayal. To study technique it is sometimes necessary to see a good film twice, as only upon second viewing can we give full attention to the cameraman's methods.

Errors in exposure are not nearly so common as they were formerly, due to today's improved films and to the increasing use of exposure meters. But errors in this class are still common, and are one of the faults that the beginner should strive to avoid. A scene which appears too light has suffered from over-exposure; too large a lens opening was used. Dark scenes are the result of under exposure—the use of too small a lens opening for the subject and the prevailing light.

More care in using the exposure chart built into or supplied with the camera may be the correct recommendation for those who have exposure troubles. But the chart can't possibly cover every possible combination of subject and light condition, and at best must leave a lot to the cameraman's judgment. And judgment, to be good, must be based upon far more constant use than the average amateur makes of his cameras.

The best way to avoid exposure trouble is to use, and use correctly, a good exposure meter. Good ones aren't cheap, but neither is film and it doesn't take long for one to waste enough film through incorrect exposure to have paid for a high-quality, dependable exposure meter.

If you are taking movies in natural color, correct exposure is even more important. Black-and-white film has considerable latitude—will give acceptable results even though not quite correctly exposed. But color film is far more exacting. To get good color, you must hit your exposures *right.* The results are certainly worth the effort.

Failure to get natural action is a common fault among amateur movie makers. Those who have taken up movies after successful experience in still photography know the interest value of unposed story-telling pictures, and their movies reflect their ability to select or to arrange pleasing subjects. But there are others who habitually line their subjects up as before a firing squad, and blaze away with the movie camera.

The resulting pictures show the fallacy of this method. The victims stand stiffly, look self-conscious, fail to move a muscle or animate a feature, or perhaps resort to horseplay which is bound to fall flat when it appears on the screen.

How much better it is to give your subjects something to do, some familiar, natural bit of action in keeping with their characters, and then take your movies while they are busy. Catch the children while they are playing. Take the adults while they are conversing, or admiring your roses, or lighting a cigar, or paying for a tank of gasoline. But don't line them up and shoot!

The eighth common error, and the last to be aired here, is lack of editing. We're not going to tell you that every personal movie must be edited to the perfection of Hollywood's best. After all, personal movie making is a diversion, not a duty. But we do believe that the bad spots should be cut from every personal film. It's easy, with a simple film splicer. And the mere cutting out of say the worst 10 per cent of a reel will make the balance seem 100 per cent better.

Cut out those scenes that are too short, the ones where the camera wiggled or was panned too fast, those which flash bright with over-exposure, those which are dark because of under-exposure, and those which you wish you hadn't taken because the expected interesting action didn't occur. Do away with them, and the rest will look far better. Go as much farther in editing as the spirit moves, but don't inflict the really bad spots upon your friends.

Eight common errors! Eliminate them and you'll have films which will do you credit. It's not hard—thousands have done it.

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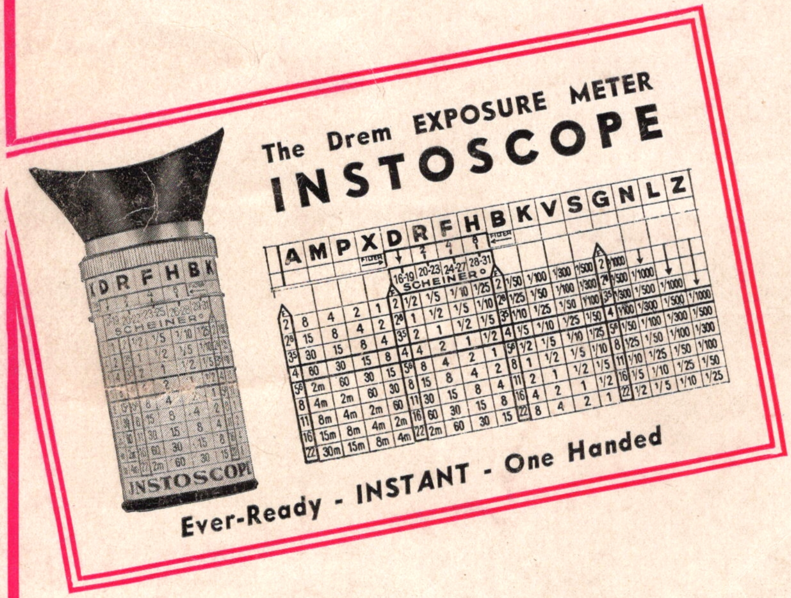
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